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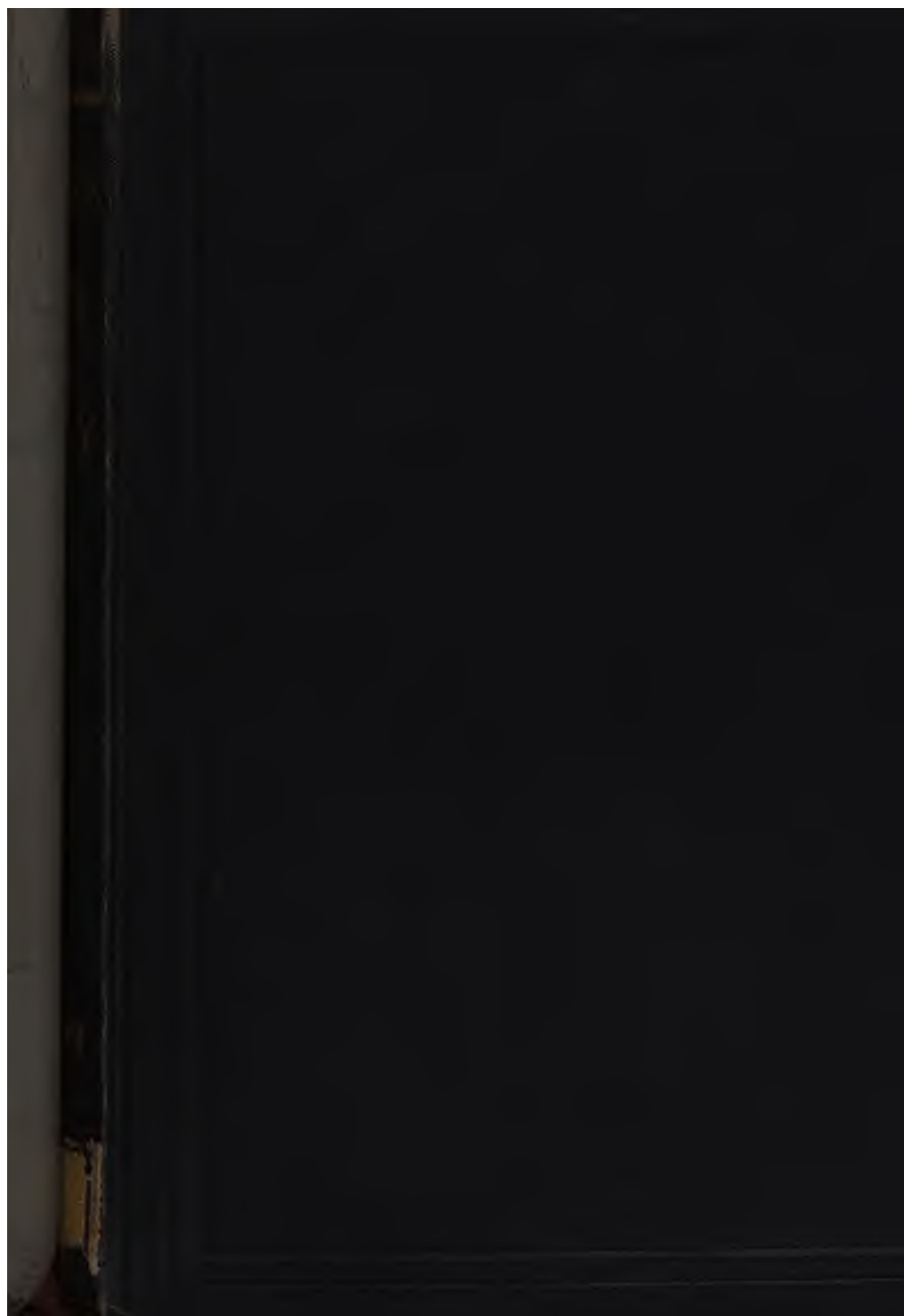
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ILLUSTRATIONS
OF THE
INFLUENCE OF THE MIND UPON
THE BODY
IN HEALTH AND DISEASE

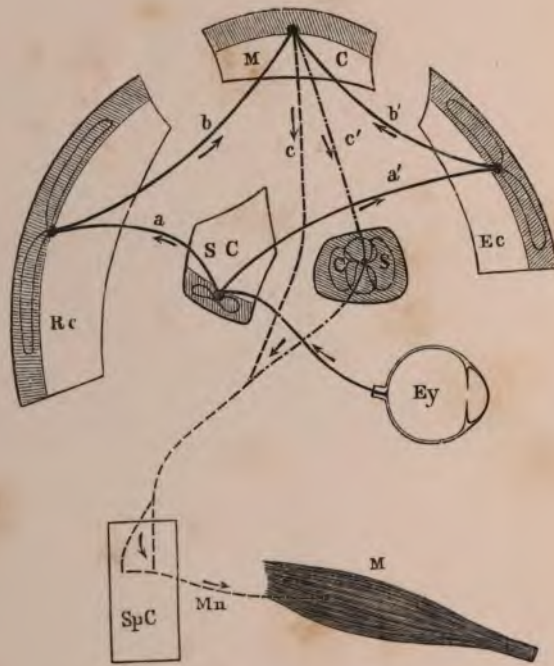
"There is not a natural action in the Body, whether involuntary or voluntary,
that may not be influenced by the peculiar state of the mind at the time."

JOHN HUNTER.

"Some are molested by Phantasie; so some, again, by Fancy alone and a good conceit, are as easily recovered. . . . All the world knows there is no vertue in charms, &c., but a strong conceit and opinion alone, as Pomponatius holds, *which forceth a motion of the humours, spirits, and blood, which takes away the cause of the malady from the parts affected.* The like we may say of the magical effects, superstitious cures, and such as are done by mountebanks and wizards. As by wicked incredulity many men are hurt (so saith Wierus), *we find, in our experience, by the same means, many are relieved.* . . .

"Imagination is the *medium deferens* of Passions, by whose means they work and produce many times prodigious effects; and as the Phantasie is more or less intended or remitted, and their humours disposed, so do perturbations move more or less, and make deeper impression."—*Anatomy of Melancholy.* BURTON, 1651.

DIAGRAM II.



For Explanation see p. viii.

ILLUSTRATIONS
OF THE INFLUENCE OF
THE MIND UPON THE BODY
IN HEALTH AND DISEASE
DESIGNED
•
TO ELUCIDATE THE ACTION OF
THE IMAGINATION

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SECOND EDITION

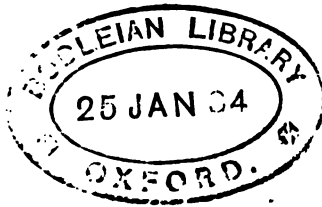
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ERRATA.

Page 116, line 25, *for Pens read Penns.*

„ 130, „ 27, *delete is.*

Pages 125 to 131, *the heading of the pages should be* “Specific influence of the Emotions, &c., upon different Organs and Tissues.”

Page 207, line 5, *after Annales read médico-psychologiques.*

„ 219, „ 11, *for says read say.*

EXPLANATION OF DIAGRAM II

MC = Motor portion of cortex of brain.

Ec = Emotional portion of do.

Rc = Rationalising do.

SC = Sensory perceptive centre in cortex.

CS = Corpus striatum.

Ey. = The eye.

Sp. C = Spinal cord.

Mn = Muscle nerve.

M = Muscle.

a a' Are afferent paths from the sensory perceptive centre to the emotional and reason centres.

b b' From these portions of the cortex fibres b b' lead to the cortical motor centres.

c c' Are efferent paths either passing straight down through the direct pyramidal tracts through the spinal cord, or, and perhaps in addition, round by the corpus striatum.

ILLUSTRATIONS
OF THE
INFLUENCE OF THE MIND UPON
THE BODY

CHAPTER IX

INFLUENCE OF THE EMOTIONS UPON THE INVOLUNTARY
MUSCLES

THE Emotions act upon the Heart and non-striated muscles with a power similar to that which they exercise over the voluntary or striated muscles ; causing contraction, spasm, and paralysis.

Hitherto we have as far as possible restricted our attention to the movements caused by the action of the emotions upon the muscles over which the Will *can* exert more or less control, whether muscles of a purely voluntary or of a mixed character, all these being striated, and supplied by nerves undoubtedly derived from, and forming an essential part of the cerebro-spinal system. From the compound character of some *acts*, as Respi-

ration, it is impossible to avoid their consideration, in both categories of muscular fibre, the voluntary and the involuntary. This must not, however, be allowed to obscure the important facts, that while all muscles are liable to be influenced by the emotions, only some can be influenced by the Will; and that these derive their nervous influence from cerebro-spinal nerves, while those which respond to emotional, but not to volitional stimuli, derive theirs chiefly, if not entirely, from the sympathetic. Claude Bernard, indeed, refuses to admit the distinction indicated by these terms, and says they ought to be expunged from the vocabulary of science; but it is sufficient to reply, in justification of retaining them, that the sympathetic ganglia enjoy certain special powers, that although the sympathetic nerves arise from the spinal cord (including the medulla) microscopists believe them to be derived from a distinct order of cells, that he himself cannot escape the distinctive use of the word against which he protests, and allows that "it is highly probable that in the difficult and complicated study of the nervous system, we meet *with two distinct orders of nerves*; the vessels are placed under the influence of the first, while the histological elements obey the power of the second; nutrition depends on the former, and physiological activity is aroused by the latter." Although he adds, that "the sympathetic nerve may therefore be viewed as a complementary apparatus placed by the side of the cerebro-spinal system," and refers the different results of excitement of the two, to the different nature of the elements on which their action is exerted, there is sufficient reason, we think, for continuing to use these

well-understood terms, while not denying the spinal origin of the sympathetic.

Passing then from the voluntary muscles, we proceed to consider the influence of the emotions upon the heart and non-striated muscles.

The Heart.—The influence of the emotions upon this organ is so remarkable, that it has always been a problem of great interest to determine the nature of their relation; and to ascertain from anatomical facts, why it is that the feelings and the heart are, and always have been, so inseparably connected. The heart, it need hardly be said, is a most prolific source of figurative modes of speech. Indeed the fact from which this arises,—that of the heart being regarded by mankind as the organ of the passions,—is itself an indication of the intimate relation subsisting between certain states of the mind* and the movements and sensations of this viscus. “Heart-rending” descrip-

* Lactantius, in making some acute remarks on the state of the mind in ecstasy, in his treatise ‘On the Workmanship of God, or the Formation of Man,’ says, “The mind which exercises control over the body, appears to be placed in the highest part of the head, as God is in heaven; but when it is engaged in any reflection, it appears to pass *to the breast*, and, as it were, to withdraw to some secret recess, that it may elicit and draw forth counsel, as it were, from a hidden treasury. And, therefore, when we are intent upon reflection, and when the mind, being occupied, has withdrawn itself to the inner depth, we are accustomed neither to hear the things which sound about us, nor to see the things which stand in our way. But whether or not this is the case, it is assuredly a matter of admiration how it takes place, since there is no passage from the brain to the breast. But if it is not so, nevertheless it is no less a matter of admiration that, by some Divine plan or other, it is caused that it appear to be so.”

tions, "cordial" expressions of good-will, and numberless cognate terms at once occur to the mind. Elihu said "at this also my heart trembleth and is moved out of his place." Dr Johnson's commentary on the word is "The heart is considered as the seat of tenderness: a hard *heart* therefore is cruelty." "Lorsque Dieu" says Bossuet "forma le cœur et les entrailles de l'homme, il y mit premièrement, la *bonté* comme le propre caractère de la nature divine."

Gesture-language is equally significant, whether in the wild Indian who expresses fear, "by putting the hands to the lower ribs, and showing how the heart flutters and seems to rise to the throat" (Tylor), or in the civilized white man who "lays his hand upon his heart" when he desires to emphasize the force of the gesture under which he labours.

It is not surprising that men should wonder how this comes to pass, if what the physiologist tells them is true, that the feelings which they associate with the heart are really seated in the brain. In Queen Elizabeth's age, a poet* wrote:

"But since the *brain* doth lodge the powers of sense,
How makes it in the *heart* those passions spring?"

The poet's reply—

"The mutual love, the kind intelligence
'Twixt heart and brain, this sympathy doth bring;"

if vague, is scarcely more so than what we find in some medical works. Burdach, writing in 1726, observes that

* Sir John Davies (the Queen's Attorney-General), in his book entitled 'The Original Nature and Immortality of the Soul,' 2nd edit., 1714, p. 78.

it is said "I love you with all my heart," "this tears my heart," &c. ; not because those sentiments are produced in the heart, but because in every violent affection, either the heart or other parts, by the movements of which we describe the affections, in our language, act *sympathetically*. ('Meditationes de Animâ Humanâ,' cap. vii, p. 198, xxii, ii, p. 75.) But Burdach was opposing the vulgar error that the heart is itself the seat of the passions. Plato had placed one of his three faculties of the mind—the irascible—in the heart, and Aristotle had made it the seat of the soul, and the origin of the nerves. Others followed in the same direction. It is remarkable that while Unzer and Prochaska entirely avoided this error, later physiologists like Virey should have returned to the old and vulgar idea. "See," says Bichat, consistently with his location of the Passions in organic life, "see the man who is agitated by anger or fury ; his muscular powers doubled, nay trebled, exert a force which he cannot even check. Whence this increased power ? Manifestly the source is in the heart" (li, p. 46). In Fear, on the other hand, the heart, also the starting point with him, sends less blood than usual to the brain, and causes feeble action of the voluntary muscles and syncope. Unzer, when treating of grief and fear, observes "an irregular influence of the vital spirits on the nerves of the heart, renders its movements at one time excessive, at another enfeebles them even to syncope" (i, p. 170). He clearly does not locate the emotions in the heart. Virey, after observing that "According to Prochaska, the passions act on the heart by means of the nerves of the eighth pair," adds "but may it not be maintained,

on the contrary, that the emotions of the heart *ascend* to the brain by these same nervous branches? For Vauvenargues said with reason, *great thoughts come from the heart.*" . . . "Instinct is innate in the breast; it emanates from within the internal organs of life; *it acts without the concurrence of the brain.*" Gall, who cites these passages only to indignantly refute them, replies, "the organ which produces an affection or a passion is, in fact, confounded with the viscera on which this affection or this passion acts. The nervous systems of the chest, the abdomen, the spinal marrow, of the senses, of the brain, are placed in communication by nervous branches in order that they may act reciprocally upon each other" (xxii, ii, p. 76).

Gall as strongly combated the notion with which these views were closely connected, that the ganglia of the sympathetic are themselves the seat of the passions, and justly asserted that "emotion being felt in certain parts, in connection with the affections and passions, proves nothing as to their seat" (l.c.)

It is not necessary to repeat the observations already made (p. 166) discarding any hypothesis in regard to the localisation of the passions, which does not refer their seat to the encephalon—employing this term in its most comprehensive sense. Their ideational element is as clearly referable to the hemispheres, whatever probability may attach to the view that the emotional element is in common with sensation, a function of one of the ganglia at the base of the brain, and in close relation with the medulla oblongata. The application of this view (or of any modification of this view, such as the localisation of

the centre of emotional movements in the medulla) to emotional disturbance of the heart and lungs, is obvious. "When a violent and sudden emotion causes death, it is in acting on the medulla oblongata that it has such a powerful effect" (Brown Séquard; lix, p. 226). It only remains to inquire here, through what nerves do the emotions influence the heart?

Heart's innervation.—Experiments which are now regarded as conclusive have determined the chief channels through which the higher centres may influence the motor ganglia of the heart. Thus it is now established that inhibitory influences are carried habitually down the vagi, while acceleration of the heart's rhythm is brought about by nerve impulses travelling along the sympathetic nerves which accompany the vertebral artery and are continued through the inferior cervical ganglion into the inferior cardiac nerves. The most important step towards clearing up the mystery surrounding the mechanism of emotional cardiac disturbance is therefore made clear. It must still be remembered that although the above explanation of emotional action through the pneumogastric and sympathetic nerves accounts for some of the more obvious and suddenly developed effects of emotion on the heart, it does not explain those cases in which gradual inhibition of the heart slowly proceeds to a fatal termination, since the effects of artificial stimulation of the vagus soon pass off, *i.e.* disappear before the nerve dies locally at the part laid bare. It is more probable that in cases of this kind there is a primary vaso-motor change leading to gradual abolition of function either of the distal centres directly (*e.g.* cardiac ganglia) or indirectly by constant

INFLUENCE OF THE EMOTIONS

inhibition originated by vascular changes in the vagal nuclei, &c.

Professor Gairdner after weighing the contradictory evidence adduced in favour of the rival theories in regard to the production of angina pectoris, points out that, if regarded as a pure neurosis, the paroxysm may be partly attributed to vaso-motor spasm affecting the cardiac circulation directly through its smaller arteries, and partly to inhibitory influence of the vagus. The latter he considers, "would account more reasonably and probably than any other for those cases of angina in which mental causes, and sudden shocks of any kind, are known to influence the production of the paroxysm, without the intervention of peripheral changes such as can be attributed to vaso-motor spasm. In cases again, resembling in their symptoms those described by Nothnagel, whether accompanied by organic disease or not—cases in which coldness of the surface, deadness of the extremities, and perhaps palpitation or increased rate of the pulse, can be ascertained to precede the cardiac pain, there would be reasonable ground for presuming that the vaso-motor nerves were the earliest involved in the morbid circle, though it is still probable that if such cases ever end in sudden death, it is through some more direct impression on the cardiac nerves or on the coronary circulation" (cviii, iv, 1877, p. 582). Professor Gairdner does not regard angina as a pure *neurosis*, but holds that the paroxysm is the expression of sudden changes which although they may arise from emotion &c, are only serious on account of their connection with actual disease in the circulatory system.

The ganglia of the heart appear to act in the way of co-ordinating the influence of all the nerves supplying the organ. As Moleschott, observes "The heart is animated by four very excitable nerves, which may be easily over-excited; these four nerves, two vagi and two sympathetics, have a peculiar consensus, which is no doubt due to the action of the ganglia of the heart, so that the state of irritation or over-excitement which is produced in one of the nerves is transmitted to the three others; but it is not possible to exhaust permanently the other three by over-excitation of one nerve *singly*, as stimulants which would be powerful enough to effect this would soon kill the excited portion of the one nerve, and therefore lose their effect upon the other three; such an effect being only possible as long as the nerve acted upon retains part, at least, of its excitability." ('Medical Times and Gazette,' July 27th, 1861).

We must, in attempting to explain the injurious mode of action of certain emotional states upon the heart, suppose that the normal control which is constantly being exercised by the pneumogastric nerve is, under excessive Emotion, so intensified by increased stimulation at its origin in the medulla oblongata, that the pulsations of the organ are partially or wholly arrested.

Illustrations.—Acceleration of the heart through the sympathetic nerves is the most frequent and obvious result of emotional excitement, and very little observation suffices to show that opposite emotions produce, in this respect, the same result. Thus Terror and Joy alike cause palpitation. It may be that palpitation from the former is in part explained by supposing it to be the pre-

cursor of flight ; but this explanation does not help us to explain the increased beatings of the heart from Joy. When, however, we speak of the same result being produced by opposite emotions, we find, on closer examination, that this sameness applies to the frequency of the pulsations rather than to their character ; that the palpitation of Joy is of the nature of increased vital action ; that of Terror of simple irritation, and is no sign of power. It may, doubtless, be laid down as a general principle that pleasurable emotions increase the activity of the vital functions, and painful ones depress them. To this rule, the influence of these opposite emotions in causing increased frequency of the heart's pulsation offers no real exception. Terror induces an irritative frequency which, if continued, ends in cessation of the contractions of the organ ; and Joy, if sudden, may be alike prejudicial. But take moderate and continuous Joy—a joyous frame of mind—and compare its effects with those of a permanently fearful or sorrowful state of the feelings, and the result will undoubtedly be in harmony with the foregoing principle. The real force and the regularity of the heart's beat will be increased under the former, and decreased under the latter condition. One of Hoffmann's aphorisms runs thus :—“ *Tristitia, cordis motum, et sanguinis circulum reddit languidiorem* ” (*Opera*, tom. i, p. 193).

To the explanation of the increased action of the heart in Terror, Mr Darwin applied two of his principles already enumerated (p. 250), namely, (1) the direct action of the sensorium, and (2) associated habit. “ When an animal is alarmed, it almost always stands motionless for a moment,

in order to collect its senses and to ascertain the source of danger, and sometimes for the sake of escaping detection, but headlong flight soon follows, with no husbanding of the strength as in fighting, and the animal continues to fly as long as the danger lasts, until utter prostration with failing respiration and circulation, with all the muscles quivering and profuse sweating, renders further flight impossible. Hence, it does not seem improbable that the principle of associated habit may, in part, account for, or, at least, augment some of the above-named characteristic symptoms of extreme Terror" (xcv, p. 78).

Irregular contraction of the heart from emotion, from slight intermission to actual spasm, is a frequent circumstance. It arises sometimes from a particular cause, and is not excited by another which appears to involve a more powerful emotion. Active anxiety or suspense has a special tendency to induce it. John Hunter says he was subject to "spasm of his vital parts" when anxious about any event—a circumstance of interest when his mode of death is remembered. "At my country-box I have bees which I am very fond of, and I was once anxious about their swarming, lest it should happen before I set off for town; this brought it on. The cats tease me very much by destroying my tame pheasants, partridges, &c., and rooting up my plants. I saw a large cat sitting at the root of a tree, and was going into the house for a gun, when I became anxious lest she should get away before my return; this likewise brought on the spasm; other states when my mind is much more affected will not bring it on" (ii, i, p. 336). Hunter could tell an affecting story without experiencing any spasm; but it acted upon his

power of articulation—he had to stop several times during its relation. Passion, as well as anxiety, affected his heart. “My life,” he used to say, “is at the mercy of any scoundrel who chooses to put me in a passion.”

The nerves supplying the heart may be so affected by emotion as to cause more violent contraction—tonic spasm—of the organ, which, from its occurrence in a vital part, is followed by death. Whether this results from the withdrawal of antagonistic nerve force, or from the direct action of nerve force upon the muscle, it may be difficult to decide.* In the case of Hunter, who died of angina pectoris, the walls of the heart were contracted when examined after death. Let us refer to the record of his death and *post-mortem*. When the Governors of St. George’s Hospital decided that no person should be admitted as a student without bringing certificates of having been educated in the profession (a regulation which appeared designed to exclude Hunter’s countrymen), he advocated at the Board the admission of two young men, inadmissible under the new rule. His biographer, Mr Palmer, states that, before the meeting, he expressed his apprehensions to a friend “lest some unpleasant dispute might occur, and his conviction that, if it did, it would certainly prove fatal to him.” “Arrived

* “Painful spasm is by no means unlikely to be associated with a tendency to sudden stoppage of the heart’s action, or virtual paralysis, whether from inhibitory nervous irritation through the pneumogastrics, or from disorders originating in the cardiac ganglia themselves, and allied in characters to true paralysis of muscular energy. . . . The question as between spasm and paralysis is one of great difficulty, if not indeed practically insoluble, in the present state of our knowledge.”—Prof. Gairdner, cviii, iv, p. 580.

at the hospital he found the Board already assembled, and entering the room, presented the memorial of the young men, and proceeded to urge the propriety of their being admitted. In the course of his remarks he made some observation, which one of his colleagues thought it necessary instantly and flatly to contradict. Hunter immediately ceased speaking, retired from the table, and struggling to suppress the tumult of his passion, hurried into the adjoining room, which he had scarcely reached when, with a deep groan, he fell lifeless into the arms of Dr Robertson, one of the physicians of the hospital, who chanced to be present. . . . Various attempts were made for upwards of an hour to restore animation, under the hope that the attack might prove to be a fainting fit, such as he had before experienced; but in vain; life had fled, and all their efforts proved useless." The *post-mortem* revealed a condition of the viscera such as might have been expected. The heart was found to be extensively diseased. It was small, appeared to have wasted, and was strongly contracted. On the left auricle and ventricle were two opaque white spots—the muscular tissue pale, and loose in texture. The coronary arteries were converted into bony tubes, with difficulty cut across, and the mitral valves were much ossified. The aorta was somewhat dilated, and its valves thickened and wanting pliancy; the inner surface of the artery studded with opaque and elevated white spots. The pericardium was unusually thickened, and did not contain much fluid. The viscera of the abdomen and head were loaded with blood, and the carotid arteries within the skull, and their branches, were thickened and ossified (ii, i, p. 132).

It is highly probable that, in such fatal cases as the foregoing, severe and persistent spasm of the heart is at times the cause of death. It seems equally probable, on the other hand, that the same fatal effect may follow from emotional excitement, inducing a very different condition of the muscular tissue of the heart. The organ ceases to contract upon its contents, and becomes dilated and powerless. These opposite conditions are seen in the voluntary muscles, and from like emotional causes; the hand being, in one case, rigidly contracted, or, in another, paralysed; and the result only differing from that of cardiac spasm or paralysis, in the circumstance of the hand not being a vital organ.

Pettigrew quotes from Senac's 'Traité du Cœur' (tom. ii, p. 454), the case of "a person who being witness to a dreadful shipwreck, was so operated upon by distress and terror, that palpitation of the heart was succeeded by oppressed breathing and syncope, and death ensued. Upon examination, the heart was found enlarged."

The late Dr Peacock, whose large experience in diseases of the heart made his opinion of great value, informed me that he had frequently observed palpitation and subsequently dilatation of the heart in women follow upon mental distress and other emotional influences. He never met with a case of rupture of the heart from emotion.

Tissot asserts that dilatation of the heart and the aorta has been caused by Anger and Chagrin, and he refers for proof of the former to Bonnet, Morgagni, and others; and of the latter to Harvey, Zimmermann, &c. Bichat

cites Desault's statement that diseases of the heart and aortic aneurisms are multiplied in revolutions, in proportion to the evils which they produce.

Speaking of intermittent pulse, Dr. Richardson observes "I have never met with a case in which the disorder was not sequential to some anxiety, shock, fear, sorrow, or their similars. I have met with case upon case in which the sufferer has been able, from his own perception of the intermittency, to register the precise moment when the injury causing it was inflicted." (xxi, Oct. 1869).

It is not surprising that in the present day, when the worry of life and strain on the feelings, in all ways, are so vastly intensified, that there should be strong evidence to show the increase of cardiac affections. From Dr. Quain's recent Lumleian Lectures on the Heart, at the College of Physicians, we learn that "during the last twenty years the total of deaths of males at all ages from heart-disease has increased in number from 5746 in 1851, to 12,428 in 1870. The number of deaths from heart-disease, for 1000 of population living, was .755 between the years 1851 and 1855; and it has risen to 1.085 from 1866 to 1870. This increase it must be observed, too, has taken place wholly in connection with the working years of active social life. There is no change in the number of deaths from this cause in males under 25 years of age. Between 20 and 45 years of age it has risen from .553 to .709 and that almost exclusively in adults, for there is scarcely any increase in the percentage of females dying from heart-disease during the twenty-five years of life from 21 to 45." (xxxii, March 23rd, 1872).

Whether twenty years hence, in the days of "The

Coming Race," when the Gy-ci of Lord Lytton will have fully engaged in the arena of public life, they will enjoy the same comparative immunity, is rather more than doubtful.

The disturbance of the heart's action indicated by syncope is a common phenomenon as the sequence of emotional excitement, and it is easy to understand how in cases where the heart is healthy, nothing more serious may occur, but where it is diseased and has already quite enough work to perform, it succumbs to any strong or tumultuous passion. We find here, as in other instances, that similar results are produced by very opposite forms of emotion—Joy and Fear—both however agreeing in this, that they are sudden and intense.

Sudden Joy, indeed, appears to have as decided an influence as Fear or Grief. It might hardly have been supposed that if we take two persons and subject one to the operation of a depressing, the other to that of an exciting emotion, the former may remain calm and the latter faint away. Yet in many instances such is the actual result. Lord Eglinton informed John Hunter that when two soldiers were condemned to be shot, but one was to receive a pardon, the event being decided by their throwing dice, the one who proved successful—thus procuring a reprieve—generally *fainted*, while the one to be shot remained calm. Sir Philip Francis referring to an important crisis in his life observes, "while my ruin was in suspense, I had felt infinitely greater distress of mind than now when it was determined. Extremities, once clear and unavoidable, reduce a man to take his resolution, and the very act of resolving gives vigour to

the mind." In the foregoing case it would seem as if the mind, having been screwed up (so to speak) to the highest pitch of suspense, at once collapsed, when no subject calculated to occupy it or rivet the attention, either of present or future interest, presented itself. Whereas, when a certain fate was impending, the mind was aroused to contemplate it, and syncope averted. It may perhaps be said that the pungency of some painful emotions really prevents fainting, while a pleasurable emotion relaxes the system and favours it. That intense pleasure may induce a fainting fit is illustrated by the case of Lucretia Davidson, the precocious American poetess who died aged 17. "Her susceptibilities were so acute, and her perceptions of beauty so exquisite, as to cause her to faint when listening to some of her favourite melodies from Moore. Yet notwithstanding this serious impression she would beg to have them repeated, so delicious were the sensations produced" (lxxviii, Jan. 1855, p. 219). The influence here, however, was no doubt of a mixed character, both emotional and sensational; the former element, nevertheless, was the proximate cause of the heart's temporary failure.

We often see that the above-mentioned stimulus of Fear prevents fainting for just so long as it operates, and that directly it is withdrawn, the system yields to a reaction. Many perform deeds of heroism in the immediate presence of danger, and do the right thing after the danger is over—swoon away. So familiar a fact may seem scarcely to deserve an illustration, but the following related by Hunter ('Posthumous Papers') is so much to the purpose that we cannot omit it. "A lady sitting up

after every one was gone to bed, saw her door open, and a servant of the house come in with a pistol in his hand. She immediately blew out the candle, pushed the bed from the wall, and escaped between them. The servant in the dark pushed down the table she had been sitting by. This discomposed him ; she came out of her hiding place, got out at the door, and had the presence of mind to lock it. She awoke the house, and as soon as she found assistance or was secure, *she fainted*, and none knew what was the matter till she came to herself. The man was secured, and it was found that he was out of his senses" (p. 265).

Tissot quotes from *Water* ('Miscellaneous Natural Curiosities,' pp. 162-298) the case of a military man, who being about to possess the object of his desire, was so overjoyed that he suddenly expired. A *post-mortem* examination was made, and the pericardium was found to be distended with blood, although no rupture of the heart could be discovered.

A *post-mortem* was also made in the following case, which illustrates the effects of Joy, during an election. Mr Froud, aged 52, of London, for many years a messenger in the War Office, became very much excited at the result of a Cabinet Council on the 23rd February, 1874. Some days afterwards he became ill, and on the following morning remained in bed reading Mr Disraeli's speech in Buckinghamshire. He then became intensely excited, expressed his delight at the success of the Conservatives, got up and walked to his wife who was in the room. She put her arms round him, and begged him to calm himself, when he slipped from her

and fell dead on the floor. Dr P. Travers Steains stated at the inquest that he made a *post-mortem* examination, which showed that the cause of death was disease of the heart accelerated by excitement. The verdict of the jury was in accordance with this opinion.

Joy caused actual death, according to Hume, at the restoration of Charles II. Dr Rush says there was a time when he doubted the truth of this assertion, "but," he adds, "I am now disposed to believe it, from having heard of a similar effect from an agreeable political event in the course of the American Revolution. The door-keeper of Congress, an aged man, died suddenly, immediately after hearing of the capture of Lord Cornwallis's army. His death was universally ascribed to a violent emotion of political joy. This species of joy appears to be one of the strongest emotions that can agitate the human mind" (lxi, p. 132). In this case and in the following, it is more than probable that death was the result of cardiac and not cerebral mischief.

A curious and sombre incident is reported from the gaming-table of Köthen in the Principality of Anhalt. A middle-aged man entered the room and sat down to play. After a run of great luck, his winnings had augmented to the sum of a thousand ducats—equal to nearly five hundred pounds sterling—which the croupier pushed over to him. The fortunate gambler did not appear very anxious to have the gold and notes, and made no response when he was asked if he wished to continue playing. One of the servants of the establishment touched him upon his shoulder to draw attention to the unheeded winnings, and to the croupier's question, but the man

remained strangely immovable; and when they came to look closer, they found that he was dead. He had 'passed' like the red! *Rien ne va plus* had proved true of himself, as well as of the last roll of the ball. Was it his good luck that had been too much for him? A thousand ducats is a pretty sum, the thought of which varies, doubtless, in proportion to the state of the pocket—but it seems hardly adequate to kill a man, under any circumstance. At all events the gambler was dead—some sudden 'click' in the mechanism of life had spoiled the works and made the subtle pendulum of being stop in its mid-swing. Even such a grim comment upon the worship of Mammon did not take away his presence of mind from the chief priest of the temple. The croupier no sooner perceived that Death had backed 'zero' and won than he raked the dead man's gold and billets back into the bank, declaring that a corpse could have no engagement or rights. The heirs of the defunct gamester are not satisfied with this axiom, and have commenced an action for the recovery of the sum."—('Daily Telegraph,' March 7th, 1870.)

We have spoken of the influence of the lachrymal secretion as an outlet for emotional excitement. When this is arrested, the bodily organs, as is well known, suffer, and the heart appears to be the first to receive the shock; cases of death are on record which appear to be referable to this cause.

In cases of exclusively cardiac paralysis the balance, as Dr Richardson would put it, between the heart and lungs is broken on the circulating side, and we may have the illustration he adduces, that of cardiac apnœa, in which

this disturbance of the normal equilibrium is exhibited. The respiratory apparatus intact and in full play, the patient breathes into lungs almost anæmic, and the tissue is more or less injured. "In one case of sudden death from this affection," he observes, "I found the bloodless lungs as white as milk, and so infiltrated with air as to distend the chest-walls, and to resist being emptied of air by the firmest pressure of the hand" (xlv, Feb. 2nd, 1867).

In some cases of death from emotional excitement, it is impossible to be certain that the heart has been the first organ to suffer; but it may be deemed highly probable in the following instances.

Several years ago a man named Filbey died at Twickenham after witnessing the death of a neighbour. I am indebted to Dr M. Ward, who attended him, for the following particulars of this case, which, with its accompaniments (four deaths in all), was tragical enough.

Dr Ward was called in on February 17th, 1870, to a Miss H—, residing next door to Filbey. He found she had been suffering for several days from fever, but had been out up to the day before. She had only returned, a few days, from attending the funeral of a sister who had died of typhus. The symptoms became rapidly worse, and she died the same night. Filbey himself, who was a butcher, came for Dr Ward shortly before her death. During the night (3 o'clock) the doctor was called up to see a sister of Miss H—, who was suffering from hysteria. Dr Ward saw Filbey at the house; he appeared to have been drinking somewhat, but talked rationally, and made the remark, "I suppose it is only

what we must expect from the shock she has received." Mrs Filbey sat up with the patient, and Filbey himself went backwards and forwards between this house and his own, during the night. He appeared quite well, though depressed, and remarked, "I have never seen any one dead before, and hope I never shall again." Between 6 and 7, his wife came in and found him dozing in his arm-chair by the fire; he conversed with her and she asked him to have some tea, but he seemed more inclined to sleep, and she left him and went to bed herself;—his daughter, however, an intelligent child of eight, remaining with him in the room. About 7.30 a.m. she found her father was slipping down in the chair, and called the cowman to lift him up, who came in and did so, and then left. An hour after, Dr Ward was sent for and found Filbey quite dead, sitting in an arm-chair with his feet on another. His face was calm and he looked asleep; the extremities were cold, but not rigid. The daughter had been in the room the whole time and had not observed any change. Dr Ward, assisted by two other medical men, made a careful post-mortem examination thirty hours after death, and could find nothing whatever to account for death. He says he never examined a more healthy body. Both ventricles of the heart contained a little fluid blood, the heart itself being normal in size and very firm in structure; its structure was not examined microscopically. The brain and cord were examined and found quite healthy, without appearing drained of blood; they were not at all congested. The stomach, which contained a little brandy and water, was healthy, as were all the other organs; "in fact," adds Dr Ward, "we

could not decide from what the man had died, but I gave it as my opinion that he had died from a sort of gradual syncope, produced by the fright, aided by the sitting posture. I certainly never met with a similar case, though I have often noticed the susceptibility of butchers to the sight of human blood, or on the occasion of any sudden illness." He appears to have been a tolerably steady man, but when he took too much was greatly excited and even dangerous. He had suffered from idiopathic tetanus years before, since which he had enjoyed good health. To wind up this tragedy, at the time of Filbey's death, his wife was expecting to be confined in about a month, and after apparently recovering well from the shock, commenced flooding in about a fortnight, and died undelivered on the day three weeks after her husband's death; a case of typhus fever being the first of this series of unhappy events.

The 'Medical Times and Gazette,' of July 28th, 1866, under the head of "Death from fear of an Operation," reports a case of death from apprehension; the more remarkable because the sufferer appeared to be in nowise a nervous person:—

"A distinguished veterinary surgeon, about sixty years of age, of good constitution, and possessed of great moral force, had suffered for a considerable period from multiple stricture of the urethra and a highly irritable bladder. After the urine had become purulent and ammoniacal, the presence of four calculi was ascertained. In the hopes of being able to perform lithotrity, M. Cazenave persevered for a considerable time in an endeavour to relieve this painfully spasmodic condition of the urethra.

These attempts were most courageously borne by the patient, but he was excessively disappointed when informed that lithotrity, which he was very desirous of undergoing, was out of the question, and that some form of lithotomy was the only operation that was eligible. Of this he was known to entertain a great dread, but nevertheless, at once gave his consent to its performance, retaining to all appearance his habitual calmness. The patient having been placed and held in position by the assistants, M. Cazenave was on the point of introducing the catheter, when the patient, who had exhibited entire calmness and serenity during the preparations, was observed to become pale and faint, and in the course of ten minutes, in spite of all that was done, he died."

Dr Currie, of Edinburgh, engaged to perform *paracentesis abdominis* in the case of a woman labouring under ascites. On entering the room the patient fainted. On attempting to restore her, he found she was dying. "She died of a sudden paroxysm of fear" (lxi, ii, p. 114).

Recently (1883) a young woman, aged 18, was frightened to death at Brockley by a practical joke, as stupid as it was criminal. She was a laundress, and being employed at Forest Hill, she walked to and from that place night and morning, passing on her journey a lonely road by the Deptford Cemetery. One evening she arrived home looking very ill and excited. In reply to questions, she said she had been frightened by a man with a white choker round his neck and over his mouth, who flew out at her by the cemetery. She then drew a chair up to the table to have some supper, fell forward with her head on the table, and after a short struggle

expired. A medical man, Mr Wallace, was called in, who arrived a few minutes after her death. At the autopsy he found all the organs healthy, except the heart. He writes to me (August 4th, 1883):—"There was thickening of the aortic valves and slight contraction; the left ventricle was very full of blood. The mitral valve was healthy. There was a large deposit of fat on the heart. I found the stomach distended with beef-steak pudding of a very inferior quality."

The verdict of the jury was "Death by syncope, due to shock to the nervous system." Strange to say, there was no rider condemnatory of the perpetrator of the joke and the murderer of the unfortunate woman.*

That the first effect of such a shock would be violent palpitation of the heart there can be little doubt; exhaustion of nerve force conveyed to the accelerators would follow, and the unrestrained inhibitory action of the vagus would stop the heart; or if, as seems possible, emotion may act equally upon the vagus and sympathetic, the cessation of its pulsations would occur from the exhaustion following the excessive discharge of centres with which both are in relation.

The next case is not so much an illustration of the influence of the Emotions as of Expectant Attention, and would have been more appropriately inserted at p.

* In the absence of legal punishment we endorse the comment of the 'Daily News' upon this case:—"It is ardently to be hoped that the joker may fall into the hands of a stronger than he, armed with a sufficient stick and skilled in its use. Such a one should assuredly not spare for the crying of the hardened fool, who makes himself a nuisance to a neighbourhood, and who in this case has brought grief to a respectable family."

115 of this work, as a fitting practical commentary upon the singular death, at an expected hour, of a young lady.

An American lady, Miss Bonney, residing at Aven, N.Y., became impressed with the conviction that her spirit was to leave the body for a time and then return. She succeeded in convincing several of her friends that this phenomenon would actually occur. She complained of no illness, but one day announced that the time had come for her departure, and after tea she took to her bed, while she remained calmly conversing with several friends until midnight. She was seen several times between that hour and two o'clock. At this time she exclaimed "Oh! this is glorious," and ceased to breathe. There was no struggle, and no evidence of pain. Her friends of course regarded the event as a fulfilment of her prediction. Miss Bonney's remains were kept unburied from the 10th November to the 5th January in the expectation of the return of her spirit. Then a coroner's inquest was held upon her decomposed body, and her death officially notified. There was a post-mortem examination, and no cause of death could be discovered, but, considering the interval which had elapsed, no importance could be attached to this.

A friend of mine vouches for the truth of the following. At Thornton, near Pickering (Yorkshire), two sisters lived (apart), both centenarians. The younger was taken ill, but said "She could na dee before oor Hannah," and recovered. Hannah died, and the doctor went from her to visit her sister. "Well, doctor, and what brings you here this morning; is it to see oor lass" (her daughter-in-law, aged 75, who lived with her)?

“No,” replied the doctor, “I came to say your sister is dead.” “At, do ye say oor Hannah has died, then I’ll just go and dee too.” She went up stairs, lay down, and expired the same afternoon.”

The story of the sudden death of the betrothed of James Dawson, a Jacobite officer, executed in April, 1746, is thus related in a letter of the time cited by Professor Morley (‘First Sketch of English Literature,’ p. 830). It must be premised that it was expected he would be pardoned, and his wedding was fixed for that day; instead of this his *fiancée* witnessed his execution. “She got near enough to see the fire kindled which was to consume that heart which she knew was so much devoted to her, and all the other dreadful preparations for his fate, without being guilty of any of those extravagances her friends had apprehended. But when all was over and she found he was no more, she drew her head back into the coach and crying out ‘My dear, I follow thee! Sweet Jesus, receive both our souls together!’ fell on the neck of her companion, and expired the very moment she was speaking.” No doubt she died from the heart, the emotional strain being followed by collapse, aided by the desire to die.

We are not aware that in any work on Forensic Medicine, the question is discussed whether death can arise from Chagrin. That it is one of practical importance may be seen from the following case, which appeared at the time it occurred in the ‘Gazetta Med. di Torino,’ Jan. 27, 1858, and the ‘Medical Times and Gazette,’ Feb. 22.

A station-master of one of the Italian railways, 55

years of age, and in robust health, was awakened one morning with the news that his station had been robbed. He felt his responsibility so acutely that he immediately became ill, and died within twenty-four hours, all the assurances of his superiors and the encouragement of his relatives failing to reassure him. There was utter prostration, spasmodic action of the stomach, with obstinate vomiting, hollow voice and failing pulse; consciousness continuing to the last.

The railway administration, in a circular to its *employés*, narrated the facts, and offered its homage to the honourable susceptibility manifested by the deceased. It was also determined that his widow was entitled to a pension, her husband having met with his death as an immediate consequence of his service. The railway being in the hands of the Government, the court whose duty it was to carry out this decision demurred, and ordered that the widow should only be paid an indemnity of 1944 *lire* (£80). She appealed against this as an unjust judgment and the case was referred to Signor Laura, Professor of Legal Medicine in the Turin University, to report upon. This he does at some length, but we can only present his chief conclusions :

1. That sudden mental emotion may induce death within a brief space of time, or even immediately, and even in persons in robust health, is a fact freely admitted in science.

2. The physical phenomena induced by such moral cause, indicate a profound perturbation of the nervous system, and are generally of a dynamic character.

3. The intimate connection of the mental emotion and

the fatal result, in this case, is shown by the facts, that the evening before, the patient was perfectly well, and when awakened from a tranquil sleep by the dreadful news, he immediately became ill. No other possible cause could be assigned for the train of symptoms that followed, as the action of his heart prior to this illness was known to have been healthy.

4. The fact of death being delayed for twenty-four hours is no proof that it was not caused solely by the mental emotion. In analogous cases, such as death from lightning or from poison, death usually sudden, may be delayed in some individuals. Mental emotions may not always operate with the same force, and may meet with a varying amount of resistance, and there are also various conditions operating, which the present state of science does not enable us to appreciate correctly. It is very possible that had the news been brought to the patient during the time when his mind was occupied with his duties, in place of when just waking from sleep, his powers of resistance would have been greater.

Professor Laura's conclusion therefore was, that the man had undoubtedly died solely from mental emotion, induced by his great anxiety for the safety of the property, no preceding or accompanying cause of death being present. The court of appeal agreed in this opinion, which was also approved by the faculty of Bologna, *and the pension was decreed to the widow as if her husband had been killed while performing services for the company.*

Blood-vessels.—Passing from the heart to the muscles by which the supply of blood to the body is regulated,

we find them to be strikingly influenced by emotional states.

Fletcher (lxxiv, p. 256) records a case of "Bellows-sound of the arteries from irritable brain," in which, "on the application of an uncommonly severe mental irritant, the stream of blood passed loudly, like a rushing torrent through the vessels." The sound, however, "floated sometimes softly like a gentle stream, then in bounds or jets synchronous with the action of the pulse, over the cavities of the trunk, from the abdominal aorta to the arch in the chest and both subclavians." The patient was a lady of forty-six. The ailments of this person—originally a spoiled child—appear to have been misunderstood. She made an unhappy marriage. "Disappointment fell heavily. Every feeling was certainly not now indulged; perhaps few, or probably she expected too much. Something, too, might be said concerning a certain green-eyed monster and his fatal and malignant sway in married life." She eventually became insane. Mr Fletcher refers the sound to a "strictured" condition of the vessels, but it is more likely to have arisen from the state of the blood, or from a relaxed condition of the vessels. "Arterial relaxation with murmur," observes Dr B. W. Richardson, "is the result of injury involving the emotional or organic nervous centres. I have seen it follow a direct physical injury, and I have seen it follow a mental shock as distinctly. It is a common result of intense grief, and is characterised by sudden changes of vascular tension, coldness, chills, frequent perspirations, irregular actions of the bowels, and often diuresis. But the most distressing symptom of all

is the arterial murmur. This is usually heard by the patient [this was so in Mr Fletcher's case], and is sometimes mistaken for aneurismal tumour. It is produced at those parts of the arterial tract where an artery runs through a rigid canal, as through the abdominal opening of the diaphragm, or the carotid canal in the base of the skull. In rigid canals, the arteries being relaxed, the sides of the vessels press, with each impulse of the heart, on the surrounding resisting wall. Thus, there is vibration, and murmur is painfully audible to the patient. In these cases the symptoms are often developed in the most sudden manner, and recovery, again, is often as equally sudden" (xxi, Oct., 1869).

Mr Fletcher gives another interesting case, of which the following is a condensed report :

A lady, when young, experienced an extraordinary degree of fright from a fall from her horse. It was a fortnight before the nervous system at all recovered from the shock. There is no doubt, however, that subsequent moral causes had a share in the full development of the case. The anomalous sounds were preceded and accompanied by a sensation in the lower part of the bowels, which resembled the crawling of worms. The sound consisted of a musical bellow-sound from the descending aorta, which the patient not inaptly called "the chimes." The sound was composed of an irregular succession of musical tones, just as the varying breeze gives melody to the Æolian harp; or it resembled the sighing of the wind through a chink in a door, or notes drawn at random across the string of a violin. It would then die away into silence, and be no more heard until

some causes of mental agitation or sudden motion of the body would reproduce it. About the same period was occasionally heard a musical sound proceeding from the left carotid in the shape of an octave, running regularly upwards. Standers by, without a stethoscope, could distinctly hear it" (lxxiv, p. 323).

The following, omitted in the section on the influence of the intellect on the vessels, is of interest in this connection :—M. Gley in a thesis written in 1881, entitled '*Etude expérimentale sur l'état du pouls carotidien pendant le travail intellectuel,*' states that he finds increased frequency of cardiac beats according to the intensity of the attention, and at the same time a dilatation of the carotid artery and a more marked dirotism of the carotid pulse, while in the radial, the phenomena are reversed. He contends that these results are not dependent on changes either of cardiac activity or the respiration, but of vaso-motor influence ('*Archives de Neurologie,*' 1882, p. 246).

I had hoped to obtain some valuable illustrations of the influence of emotion on the blood-vessels from Mosso's plethysmograph, but the instrument requires such delicate manipulation to avoid error, that it appears to be unsafe to draw any inferences at present from its use.

The attention directed, during the last few years, to the muscular tissues of the blood-vessels and to the vaso-motor nerves, has thrown great light upon the long-observed fact of the influence of Emotion upon the vessels. The pallor induced by Fear, the crimson blush of Shame,

"O Shame! where is thy blush?"

and the flush of Rage (analogous to the turgescence of the comb in the game cock and turkey), are psycho-

physical phenomena universally recognised, and indicate the remarkable local vascular changes caused by various feelings of the mind, independently of the general disturbance of the circulation which emotional excitement may produce, by acting, as already described, upon the heart itself. The influence of Emotion on erectile tissues belongs to the same class ; in fact, the increased action of the heart and rapidity of the general circulation may in this instance prove actually antagonistic to local hyperæmia. Claude Bernard's demonstration of two circulations—the cardiac and the capillary—the latter being directly controlled by the nervous system and acting “separately upon each individual spot of the body,” is applicable here. It helps us to understand how some parts of the system may remain in their ordinary condition, while others are morbidly affected or exhibit certain physiological phenomena. Blushing may be referred to as a typical example of the momentary paralysis or suspension of that vaso-motor nerve-influence which induces the ordinary contraction of the capillaries ; such suspension of the contracting power by an emotion being followed by congestion of the vessels of the face. Opposite emotions, according to the same theory, either stimulate the contractors of the minute vessels or simply permit their action by suspending the antagonising cerebral influence.

Fear of bad news of Collatinus alternately flushed and blanched the cheeks of Lucrece :

“ O how her fear did make her colour rise,
First red as roses that on lawn we lay,
Then white as lawn, the roses took away.”

So human is blushing that, as Darwin says, "It would require an overwhelming amount of evidence to make us believe that any animal could blush" (xcv, p. 311). He mentions three cases of very young children blushing. Two were under three; one was four; as might be expected idiots rarely blush. Sir James Paget at Darwin's request observed carefully the extent of blushing, and never found it pass below the upper part of the chest; rarely as low as the collar bones and shoulder blades; but one instance is recorded of the whole body blushing from shame. It appears, although the evidence among travellers is somewhat contradictory, that there is no race of men in which blushing does not occur.

The remarkable relation between certain moral feelings and blushing has ever attracted attention, and various explanations have been attempted. Darwin has exhibited much ingenuity in proving that the fundamental element in the acquirement of the habit is the attention paid to personal appearance, and not to moral conduct, the contention being that primæval man, prior to his acquiring much moral sensitiveness, would be very sensitive about the appearance of his body. The face being the part most regarded, any sense of shame in reference to it would be accompanied by a desire to conceal it, and the wish to restrain it would aggravate the tendency in this region by the concentration of the attention thither. Regard for the opinion of others is, in accordance with the same explanation, the fundamental principle as respects blushing from purely moral causes.

Language derives several figurative expressions from this source, of which the German word for blushing—

schamröthe—is a striking example. In our own language there is no corresponding term, but the man who might seem never to have blushed in his life, and one thinks never will, finds, when charged with a shameful act, no stronger expression for the denial of it, than “I should *blush* to do it.”

Increased vascularity under the influence of Emotion, chiefly when sudden, frequently causes extravasation or rupture of the small blood-vessels. Such cases must not, of course, be confounded with those in which violent contraction of the voluntary muscles occasions injury to the vessels imbedded in their tissue, and consequent effusion of blood. As vascularity, whether with or without extravasation of blood, forms one of the prominent signs of inflammation, it follows that the illustrations given will more or less merge into examples of an inflammatory condition of the part, attended by swelling, tenderness, and heat. In all, however, the influence of mental states upon the blood-vessels is exhibited.

In illustration of the influence of Fear or apprehension upon the vascular system, I shall first give the following example,* the case of a highly intelligent lady well known to myself. Although the emotion had for its object another person, it none the less acted upon her own system :

One day she was walking past a public institution, and observed a child, in whom she was particularly interested, coming out through an iron gate. She saw that he let go the gate after opening it, and that it seemed likely to close upon him, and concluding that it would do so with

* See also ‘Manual of Psychological Medicine,’ 4th edit., p. 229.

such force as to crush his ankle; however, this did not happen. "It was impossible," she says, "by word or act to be quick enough to meet the supposed emergency; and, in fact, I found I could not move, for such intense pain came on in the ankle, corresponding to the one which I thought the boy would have injured, that I could only put my hand on it to lessen its extreme painfulness. *I am sure I did not move so as to strain or sprain it.* The walk home—the distance of about a quarter of a mile—was very laborious, and in taking off my stocking I found *a circle round the ankle, as if it had been painted with red-currant juice, with a large spot of the same, on the outer part.* By morning the whole foot was inflamed, and I was a prisoner to my bed for many days."

A very similar experience is related by Dr Marmise, of Bordeaux, of a lady's maid who was present when her mistress was bled, whom she had assiduously nursed for a long time. She experienced so powerful an emotion that at the moment when the surgeon put his lancet into the patient's arm, she felt in the bend of the elbow the sensation of a prick, and shortly after there appeared an ecchymosis at this spot ('*Union Médicale,*' 1862).

A very interesting example of a local affection, caused by an excited imagination, is reported by Tissot, on the authority of Hoffmann. A man believed that he saw and was seized by a spectre, and was terribly frightened. One of his feet immediately became red and swollen, and afterwards suppurated. He became also convulsed and delirious. It is not stated distinctly whether he fancied the spectre seized him by the affected foot. If such was the case, the narrative would derive additional

interest from the circumstance that the site of the bodily affection was determined by, and corresponded to, the locality imaged in the mind. The fact, in any case, remains, that fright produced inflammation and supuration of one of the feet (xxxv, Sept., 1865, p. 164). The same authority records the case of a young man who was thrown into a passion, upon which his left ankle became swollen and painful. The knee also was similarly affected afterwards.

Fear during sleep is stated to have caused local inflammation corresponding with the image present in the mind in a dream. In the 'Bibliothèque choisie de Médecine,' by Planque, tome vi, p. 103, is the following case:— A man, thirty years of age, healthy and robust, saw in a dream a Pole with a stone in his hand, which he threw at his breast. The vivid shock awoke him, and then he found that there was on his chest (*dans le même endroit*) a round mark, having the appearance of a bruise. Next day there was so much swelling, &c., that a surgeon was requested to see it, who, fearing a slough, scarified the part, and relieved it. The wound healed in a short time. Without more definite information it would not be safe to build a theory upon this case, but looking at the previous one of the spectre, and others equally well authenticated, there appears no reason to doubt that the dream and the inflammatory action of the skin stood in the relation of cause and effect. Had there been any thing incredible in the dream acting as a cause, we might have thought it possible that the man had unawares received a blow, the previous day, in the region of the bruise and that it had suggested the dream. Its admission

as evidence must then be determined by the authenticity of other examples, whether occurring when a person is awake or during sleep.

A powerful mental impression produced, in the following instance, physical effects corresponding in their locality to those anticipated in another person :

In the 'Medical and Surgical Journal,' May, 1835, a case is recorded "as having happened in France, in the practice of M. Diez, a French surgeon, of a lady, who is designated as Madame G—, aged 24 years, whose lips and mouth became suddenly enormously swollen, from having seen a child of a few years old pass the sharp blade of a knife between its lips without even cutting itself, which intumescence it required the usual applications to subdue, and which is represented to have had an appearance similar to that produced by the sting of a wasp, or some other poisonous insect, which there was no possibility of having occurred. This case is curious, as the organ affected was the same as the one for the apprehension for which, in the child, the nervous horror was experienced. How nature acted in this case it is, of course, impossible to suppose" (xli, p. 51).

In a case recorded by Lauzanus, mental excitement from a slight cause produced signs of local vascular disturbance ; probably mere Attention, without an emotional state being aroused, would have hardly sufficed to do so. A young woman witnessed the lancing of an abscess in the axilla, and not only did she immediately experience pain in that region, but this was followed by inflammation and a decided swelling (lx, p. 154).

It may at first sight seem an extraordinary, almost

incredible thing, that the action of the emotions should produce congestion in any clearly circumscribed spot, that spot being determined by the direction of the thoughts at the moment; but facts of the same kind, though less striking in their results, are familiar to all. Thus, no one would regard it as remarkable that on picturing oneself in a dangerous position—the foot, for instance, caught in a man-trap—the limb should start spasmodically, or experience a sensation of discomfort or actual pain. Yet so simple a phenomenon involves the same principle as the other more striking fact—the localisation of thought or emotion in the body, indicated by some external signs more or less marked according to the age, sex, constitution, or health.

Although repeating what has already been said in the chapter on the influence of the Intellect upon the involuntary muscles, we may observe that the fundamental principle upon which the class of phenomena now under consideration depends is this: that the mere circumstance of thinking of any part of the body, whatever may be the exciting cause, tends to augment the local afflux of blood, and innervation. Motion or sensation, or both, occur in the locality to which the thoughts are directed; but this effect is greatly intensified if accompanied by a powerful emotion.

Simple as this law is, it does, in fact, embrace and explain numerous facts which appear at first sight inexplicable, or to require more complete explanation.

Thus, if I see an injury done to the limb of another, my thought is turned to it, and by an inevitable association of ideas, based, in this case, on the far-reaching law

of self-preservation, it is also directed to my own limb, and naturally to the corresponding one. Hence some effect is almost sure to follow—whether slight, or so decided as to leave its mark upon the tissues, or cause intense pain, must depend upon the force of the impulse conveyed from the brain, and the sensibility of the individual's system.

The evidence which can be adduced to establish a concurrent affection between the same limb or region of our own body as that of another person upon which our imagination is rivetted, is confirmed by the movements, *not* hidden from the view, which we instinctively perform. Thus, if we observe a man receive an injury to any part of the body, we frequently apply our own hand to the corresponding part of our own body. It may be said this is the consequence of a sensation of a painful kind experienced by ourselves in the part. Possibly, but if so, the explanation is itself a proof of the position we seek to maintain ; if on the other hand, these *external* movements constitute an independent series of facts, it may be inferred from the relation existing between the vivid image in the mind of a certain person's limb, and his corresponding member, that a like relation may exist between the former factor and *internal* movements. In this connection it is also curious to observe how constantly it happens that, without the occurrence of any accident calculated to direct the attention strongly to a particular limb of another person, we assume the attitude of the person we are conversing with. A places his arms akimbo ; B automatically does the same. A scratches himself ; B follows his example. Hence the contagion of bad habits ;

hence the importance of good example. But the bearing of these everyday facts upon the subject under consideration is simply this: if there be so marked a change in the outer man corresponding with another person's condition, there is no reason to doubt an analogous change in the inner man. Call it imitation, or sympathy, or imagination, or what you will, the power which it exercises is so obvious in those parts of the body which can be seen, that we can have little difficulty in inferring changes from the same cause in those parts which cannot be seen. If A's hand is instinctively placed on the breast when he sees B plunge a dagger in his, there is every reason to believe that there may be hidden movements in the muscular coat of the vessels, not less definite, and resulting from a common law.

The influence of emotions on the blood-vessels aids in determining a rise of *Temperature*, as we have seen to be the case in purely intellectual operations (vol. i, p. 133). The experiments of Dr Lombard are available here also. Poetical and prose compositions of an emotional character were employed by him to arouse the feelings. He found that its influence on the temperature of the head showed itself more quickly and in a more marked manner than in intellectual exertion. As in the previous experiments each region of the head was tested separately, the areas selected for examination being the same as in the corresponding experiments (see vol. i, p. 136 of this work).

Dr Lombard also found that emotional activity like intellectual work causes a rise of temperature different in all three regions of the head; that less difference exists in the rapidity and degree of rise of temperature in

different regions in emotional activity than in intellectual work, but that the order of the regions, with regard to the comparative degree of rise of temperature is, so far as the three spaces in question are concerned—the same in both cases (xci, p. 177).*

The effect of moderate anger on temperature was examined in four instances, in the same individual, the examinations being made when the first intensity of passion had subsided, and indignation had succeeded. The quickened circulation and respiration had subsided and the colour of the face was not heightened. In one instance nothing definite was observed; in the other three the results were well-defined. These are tabulated most minutely, and are too elaborate to be introduced here. As an illustration, however, of the results obtained in one experiment we give the following figures.

Examination of 3rd district, 3rd tier, anterior region, left side.

+ Signifies rise of temperature above starting point.

Time from commencement of work.	Deflections of Galvanometer.	Themometric Values. Fahr.	Mental condition.
At the end of—			
0 minutes	0°	0°	Commenced mathematical work.
15 "	+ 12°	+ 0°0432°	
17 "	+ 10°5'	+ 0°0378°	Work interrupted and

* Dr Lombard believes that all the higher degrees of rise of temperature at the surface of the head, during both intellectual and emotional activity, are "in part owing to vascular disturbance." The rise of temperature of nearly 0°9° F., observed by M. Broca after ten minutes' reading aloud, would appear to be partly due to the above cause" (note, p. 202).

19	„	+ 12°	+ 0.0432°	subject greatly annoyed.
22	„	+ 15°	+ 0.054°	
25	„	+ 16°	+ 0.0576°	Annoyance disappearing.
26	„	+ 15°	+ 0.054°	
29	„	+ 13°	+ 0.0468°	
31	„	+ 12°	+ 0.0432°	Annoyance completely gone, and work resumed.
33	„	+ „	+ „	
37	„	+ 11.5°	+ 0.0414°	

In this experiment the rise of temperature above starting point was only 0.0378° on the work being interrupted, but it rose from annoyance to 0.0576°, being an increase of 0.0198° in the eight minutes of its continuance.

In one case the subject was “much vexed” and the temperature which had been raised in the first place by conversation, was further and decidedly increased by vexation, the increase being 0.0432° F. It should be observed that after the complete disappearance of the mental disturbance, the temperature still remained above its first level, falling only very slowly (*xc*, p. 205). Dr Lombard observes that from these and other experiments, “it would seem not unlikely that the comparative effect on the temperature of different spaces of anger and vexation follows a similar rule to that usually applicable to intellectual work and the particular kind of emotional activity which we have principally studied,” (p. 207) and he summarises his general conclusions by saying that “all parts of the surface of the head—even when taken in small sub-divisions—show an increase of temperature during all kinds of mental work; but that some parts

are usually more active in this respect than others: although here again, the different parts seem to be able to supply each other's places—the commonly less active part not unfrequently superseding its ordinary superior" (p. 208).

Of course, a question of great interest arises here, namely how far the temperature of points of the outer surface represents the temperatures of points of the convolutions beneath? Dr Lombard's reply is, that while there is no certainty that the relative temperatures of small subdivisions of the outer surface represent with exactitude the relative temperatures of the underlying tracts of brain surface, it is highly probable that in the larger areas "the relative elevations of temperature, during mental exercise do represent with considerable correctness the relative degrees of functional activity of the corresponding underlying portions of brain surface" (xci, p. 209).

Sir James Paget observes that, "Habitual or very frequent coldness of the feet, probably indicates a contraction of the small blood-vessels dependent on disorders of nervous supply. For the phenomena are very variable. Some patients have such feet as, they say, cannot be warmed; they are cold all night, cold while lay wrapped in warm flannel; and even when warmed, they may become cold under mental influence. But in some the feet, after being cold all day, flush in the evening; in others they become red, and even painfully hot, puzzling the student of diagnosis. Such variations, in the state of the blood-vessels in any part, seem to tell of nervous disorders overrunning from the cerebro-spinal into the vaso-

motor system." "Many sensitive persons shiver at very slight provocation; for instance, when they are in pain or anxious. . . . In hysterical persons, a shivering may take the place of an ordinary hysteric fit. . . . Mere nervous excitement may raise the temperature to at least 101° " (xlix, p. 197).*

The occurrence of hæmorrhage in the brain and lungs in connection with emotional excitement, may here be briefly referred to.

Rupture of vessels of brain.—The stimulating influence of Emotion on the cerebral vessels, short of rupture, is witnessed in cases in which the surface of the brain is exposed by accident. One is recorded in the *Medico-Chirurgical Review* (No. 46, p. 366). A robust young man lost a considerable portion of his skull. "When excited by pain, Fear, or Anger, his brain protruded greatly, so as sometimes to disturb the dressings, which were necessarily applied loosely; and it throbbled tumultuously, in accordance with the arterial pulsations." In such a state, it is easy to understand an apoplectic sequence. Vaso-motor spasm may also cause rupture of the vessels.

In March, 1870, a case of apoplexy from Fright and Anger occurred at Bradford, for the particulars of which I am indebted to Dr Bell. A man who had previously threatened violence to some persons in the house where a woman lived, threw a stone against one of the windows.

* Dr Bechterew, of St Petersburg, has made a number of observations on the temperature of the insane, showing its fall in various forms of insanity, even great mental excitement ('*St Petersburg Medecinische Wochenschrift*,' 1879, 1881).

This woman, aged 56, nimbly came up from the cellar, went across the road to make inquiry, crossed to her own house again, complained of her hand feeling numb, went upstairs, threw herself upon the bed, and became insensible. This occurred about 7 p.m. Dr Bell saw her at 9 p.m., when he found the right side, but not the face, paralysed. The patient occasionally opened her eyes and looked about. Died about 2 a.m., seven hours after the attack. *Autopsy*, eighteen hours after death.—“Very fat. On opening the head, the superficial vessels were found very full of black blood; and on removing the brain there were several ounces of bloody serum about the medulla oblongata. On slicing there was seen a large pitchy black clot equal to size of fist in left middle lobe, opening into left lateral ventricle, between corpus striatum and optic thalamus, bursting through septum lucidum into right ventricle and filling it with bloody serum. The descending cornua of both lateral ventricles were filled with bloody serum, which had also burst through the base of the brain. Nothing apparently amiss with the medulla. The left ventricle of the heart was considerably hypertrophied and contracted; no disease of the valves or aorta; did not notice any disease of the vessels of the brain, but suppose such must have been the case, and that an unusually powerful heart, suddenly acting upon weakened cerebral arteries, caused their rupture. She had been remarkably healthy. Nothing unusual was observed about her immediately before she ran upstairs.”

In May, 1873, a well-known stockbroker in Paris, M. Rôdriques, fell down in a fit which proved to be apo-

plectic, dying a few hours afterwards, under the following circumstances. The body of a man was found in the Bois de Boulogne, shot through the head. This was found to be the *valet de chambre* of M. Rodriques, and it was on communicating the fact to his master that the fatality occurred.

John Hunter adduces as an instance of "mental emotion" inducing apoplexy, the case of "the person who invented or applied the steam-engine to the sailing of ships, and who, when it was before the Committee of the Society of Arts and Sciences, was taken at once with an apoplectic stroke, of which he died in about twenty-four hours" ('Posthumous Papers,' vol. i, p. 264).

In the 'Lancet' of Nov. 16th, 1867, occurs a good example of the influence of Joy succeeding Anxiety in inducing death, recorded by the registrar of Preston, Lancashire. The subject was a female, aged 43, the wife of an overlooker: It appears that the daughter of the deceased was travelling by railway when a collision occurred, which caused injury to a large number of passengers. Alarming reports concerning the accident had reached the mother as she was waiting at the station for her daughter, who soon after arrived *unhurt*. The transport of joy, supervening on a state of mental anxiety, was more than her physical organisation could bear. The mother after clasping her child in her arms, fell down in a fit, and expired twelve hours afterwards. In the medical certificate the case was returned as "apoplexy." It recalls the observation of Haller that "excessive and sudden Joy often kills by increasing the motion of the blood, and exciting a true apoplexy."

Dr Rush in his essay "On the Influence of the Revolution upon the Human Body" states that more instances of apoplexy occurred in the city of Philadelphia in the winter of 1774-5 than had been known in previous years. He says, "I should have hesitated in recording this fact, had I not found the observation supported by a fact of the same kind, and produced by a nearly similar cause, in the appendix to the practical works of Dr Baglivi, Professor of Physic and Anatomy at Rome. After a very wet season in the winter of 1694-5, he informs us that "apoplexies displayed their rage; and perhaps some part of this epidemic illness was owing to the universal grief and domestic care occasioned by all Europe being engaged in a war. All commerce was disturbed, and all the avenues of peace blocked up, so that the strongest heart could scarcely bear the thoughts of it." The winter of 1774-5 was a period of uncommon anxiety among the citizens of America. Every countenance wore the marks of painful solicitude for the event of a petition to the throne of Britain, which was to determine whether reconciliation, or a civil war, with all its terrible and distressing consequences, were to take place. The apoplectic fit which deprived the world of the talents and virtues of Peyton Randolph, while he filled the chair of Congress, in 1775, appeared to be occasioned in part by the pressure of the uncertainty of those great events upon his mind. To the name of this illustrious patriot several others might be added, who were affected by the apoplexy in the same memorable year" (lxi, i, p. 131).

In many cases of death from emotional excitement it

is impossible to determine, from the absence of particulars, whether lesion of the heart or brain has been the cause of the fatal result ; as for example with Isocrates, to whom Milton's lines refer :

“ As that dishonest victory
At Chæroneæ, fatal to liberty
Killed with report that old man eloquent.”

Did he die of apoplexy or “ a broken heart ?” It is impossible to say.

Rupture of pulmonary vessels.—Descuret records the case of a woman, aged 64, subject to violent fits of passion, in one of which “ her little eyes sparkled, her face was injected, her large jugulars were distended, and a violent fit of coughing brought up in my presence bloody expectoration of a bright colour.” She was relieved by bleeding, &c.

Under this head falls the story told of a Doge of Venice, Francis Foscari, who in 1457 died suddenly from hæmoptysis on hearing the bell of St Mark's announce his successor (Sismondi and Daru, vol i).

Dr Sweetser cites from Broussais the case of a lady, “ who on feeling a living frog fall into her bosom from the claws of a bird of prey whilst she was sitting on the grass, was instantly seized with such a profuse bleeding from the lungs that she survived but a few minutes” (xlili, p. 28).

Bloody sweat.—The rupture of the cutaneous capillaries, or the transudation through their walls of blood so as to occasion “ sanguineous perspiration,” should be enumerated here among the results of emotional excitement.

I can, however, only refer to one well-marked case of

the kind—that of “a sailor, aged 30, who was so alarmed by a storm that he not only fell on the deck speechless, but on going to him, Paulini observed large drops of perspiration of a bright red colour on his face. At first he imagined that the blood came from the nose, or that the man had injured himself by falling; but on wiping off the red drops from the face, he was astonished to see fresh ones start up in their place. This coloured perspiration oozed out from different parts of the forehead, cheeks, and chin; but it was not confined to these parts for on opening his dress he found it formed on the neck and chest. On wiping and carefully examining the skin, he distinctly observed the red fluid exuding from the orifices of the sudoriparous ducts. So deeply stained was the fluid that on taking hold of the handkerchief with which it was wiped off, the fingers were made quite bloody. As the bloody perspiration ceased, the man’s speech returned” (lxxi, p. 61).*

Before passing from the blood-vessels, we should notice the brilliancy of the eye caused by certain emotional states, as joy; partly due to tension of the muscles of the eyeball, but also to the heightened vascularity.

There are several references to the appearance of the eyes under the influence of anger in the ‘Iliad.’

The appearance of the eye in fierceness and fear is beautifully described in “Rokeby:”

* The interesting fact has recently been recorded by Mr Frank Buckland, in ‘Land and Water,’ that a hippopotamus, being excessively savage after her confinement, perspired profusely, the perspiration being the colour of blood. Professor Gulliver found on examination that it contained numerous blood-corpuscles.

“Hiding his face, lest foemen spy
The sparkle of his swarthy eye.”

Scott remarks on these lines, “After one of the recent battles, in which the Irish rebels were defeated, one of their most active leaders was found in a bog in which he was immersed up to the middle, while his head was concealed by an impending ledge of turf. Being detected and seized notwithstanding his precaution, he became solicitous to know how his retreat had been discovered. ‘I caught,’ answered the Sutherland Highlander, ‘the sparkle of your eye.’ Those who are accustomed to mark hares upon their form, usually discover them by the same circumstance” (Canto iii, Stanza iv).

Of Augustus it is said that, “like Apollo, his eyes were clear, and he affected to have it thought that they possessed some divine irradiation, and was well pleased if when he fixed his eyes upon anybody, they held down their eyes as if overcome by the glaring brightness of the sun.”

The iris.—The influence of Emotion upon the iris is shown in Terror by the widely dilated pupil. Gratiolet calls it the pathognomonic sign of this emotion. “Son disque noir semble quelquefois avoir envahi le cercle entier de l’iris ; l’œil semble regarder alors dans des ténèbres profondes. Une pupille contractée ne convient pas à cette passion” (xv, p. 379). Here it would seem that the action of the sympathetic nerve supplying the radiating fibres of the iris, is allowed full sway by the temporary suspension or paralysis of the function of the antagonising cerebro-spinal nerve (third nerve), induced by the shock of fright. It may be noted that the modern

doctrine respecting the antagonism of sympathetic and cerebro-spinal nerves, has sprung from a study of the supply of nerves to the radiating and circular fibres of the iris from these two systems, "the phenomena which take place in vessels being assimilated," as Bernard observes, "to those which occur in the iris" (1872); contraction of the radiating fibres of the iris answering to the contraction of the capillaries; that of the circular fibres to their active dilatation. Thus, Terror dilates the pupil because it allows the sympathetic free play upon certain muscular fibres of the iris, and induces pallor by allowing the sympathetic to contract the superficial capillaries.

Mr J. W. Clark (see p. 49) informs me that he has been making observations on the dilatation of the pupil in two dogs, and that he has not the smallest doubt that fear causes dilation of the pupil. The fear of falling and the fear of being beaten induced it. Other forms of excitement, however, appear also to cause dilatation. Another gentleman who has observed the effects of emotion on the pupils of his parrot, says its pupils dilate with pleasure and contract with displeasure.

Dr Wilks, to whom I recently applied for any observations he might have made on his historic parrot,* writes to me under date Feb. 22nd, 1883. "I have long observed the eye of my parrot. It is constantly vacillating; when frightened and angry the pupil is contracted, when good tempered it is dilated. When being stroked and pleased, the pupil widely dilates. It has long been known in my house as the "benevolent eye." In the human being

* See 'Journal of Mental Science,' July, 1879.

I have thought that the same fact is to be observed. I have made inquiries among friends and I have found that the thing is known to certain persons—that pleasurable emotion will cause dilatation of the pupil. I am assured that the entry of a gentleman into a room where there is a lady who has a penchant for him, will cause an expression unmistakable to another woman, and that part of this is due to the dilatation of the pupil. I think Balzac may be admitted as a master of physiognomy, and he says the same.* He speaks of a girl at church concentrated upon religious acts, putting on an angelic look with large pupils. I am now inquiring of artists in reference to the old Italian devotional pictures, whether any peculiar state of the pupils is apparent. If belladonna is named as it is said to be, from its rendering a woman beautiful by dilating the pupil, it is clear that it is a condition admired, and therefore must belong to the better emotions, and, on the contrary, a contracted pupil would be disliked, because in all probability associated with bad temper and evil passion. Physiologically, the condition is interesting as implying a passive state—a blissful repose or ecstasy in distinction to the contracted pupil of strong mental action. Surely a painter would know whether he would

* “Veronique était changée pour quelques instants. La prunelle de ses yeux, douée d'une grande contractilité semblait alors s'épanouir et repoussait le bleu de l'iris que ne formait plus qu'un léger cercle. Ainsi cette métamorphose de l'œil devenu aussi vif que celui de l'aigle, complétait le changement étrange du visage. Était-ce l'orage des passions contenues, était-ce une force venue des profondeurs de l'âme qui agrandissait la prunelle en plein jour, comme elle s'agrandit ordinairement chez tout le monde dans les ténèbres, en brunissant ainsi l'azur de ces yeux célestes ?”

make the pupil different in a madonna, adoring angel, or in such an eye as Millais gave Gladstone.*

The Skin.—*Cutis anserina* and *horripilatio* (observe its synonym *horror*) are the well-known effects of emotional excitement, especially Fear, on cutaneous muscle. The former so familiar to all, finds a poetical illustration in Joanna Baillie's lines :—

“Yea, when the cold blood shoots through every vein ;
When every hair's-pit on my shrunken skin
A knotted knoll becomes, and to mine ears
Strange inward sounds awake, and to mine eyes
Rush stranger tears, there is a joy in Fear.”

The latter is no doubt assisted by the action of the occipito-frontalis in producing constriction of the scalp, but this could not cause the phenomenon of “the hair standing on end,” without the contraction of the involuntary muscular fibre surrounding the roots of the hair.

“Why do I yield to that suggestion
Whose horrid image doth unfix my hair ?”

Eliphaz and Æneas alike afford familiar illustrations of this phenomenon. Fear came upon the Temanite when he saw in his dream a mysterious, unearthly figure, and he says that as it passed before him, “the hair of my flesh stood up.” The Trojan, frightened by the shade of Creüsa, tells the same story, “*obstupui, steteruntque comæ.*”

On the erection of the hair, Darwin, as usual, has many interesting remarks. “These appendages (hairs,

* See also article in ‘Brain,’ April, 1883, and Dr Wilks’s ‘Diseases of the Nervous System,’ 2nd edit., 1883.

feathers, &c.) are erected under the excitement of Anger or Terror; more especially when these emotions are combined or quickly succeed each other. The action serves to make the animal appear larger and more frightful to its enemies or rivals, and is generally accompanied by various voluntary movements adapted for the same purpose and by the utterance of savage sounds." After giving examples in the chimpanzee, orang, gorilla, the lion, cat, dog, elk, goat, bat, cock and hen, swan, owl, hawk, &c., Darwin proceeds "We thus see how generally throughout the two higher vertebrate classes, and with some reptiles, the dermal appendages are erected under the influence of Anger and Fear." "The movement is effected, as we know from Kölliker's interesting discovery, by the contraction of minute unstriped involuntary muscles, often called *arrectores pili*, which are attached to the capsules of the separate hairs, feathers, &c. . . . The erection of the hair is, however, aided in some cases as with that on the head of a man, by the striped and voluntary muscles of the underlying *panniculus carnosus*. It is by the action of these latter muscles that the hedgehog erects its spines" (xcv, p. 101).

Darwin regarded this action as at once incidental and non incidental; purposeless and purposeful. Thus after saying that, "it must be looked at when occurring under the influence of anger or fear, not as a power acquired for the sake of some advantage, but as an incidental result, at least to a large extent, of the sensorium being affected," he qualifies this statement by "it seems hardly credible that the co-ordinated erection of the dermal appendages, by which the animal is made to appear larger and more

gastric; the longitudinal supplied by the splanchnic (Biennial Retrospect, 1865-6, New Syd. Soc.).

Digestion is affected by the contractions of the muscular coat of the stomach as well as by the amount and character of the gastric juice, and therefore the disturbance of this process which so often results from emotional changes is due, in part, to abnormal contraction of these muscular fibres. Dr Carpenter cites from Brachet the experiments upon the pneumogastric nerve in which "some hours after section of the nerve on both sides, the surface only of the alimentary mass was found to have undergone solution, the remainder of the mass remaining in the condition in which it was at first ingested," and he observes that "the moderate excitement of pleasurable emotions may be favourable to the operation, not only by giving firmness and regularity to the action of the heart, and thence promoting the circulation of the blood, and the increase of the gastric secretion, but also in imparting firmness and regularity to the muscular contractions of the stomach" (viii, p. 408).

A clergyman informs me that, once, on the receipt of distressing news, he laboured under spasmodic action of the stomach for three days, causing violent vomiting for two or three hours at a time. He was unable to take food, and there was no action of the bowels.

Of the influence of Emotion in increasing the peristaltic action of the intestines, the ordinary effect of Fear and Fright affords the readiest illustration. The simple result of this muscular contraction—the discharge of the contents of the bowels—is rarely unmixed with increased secretion from the intestinal glands, and therefore we

shall have to return to the consideration of these effects when we speak of secretion and excretion. It must be noted here, however, that the involuntary muscular fibres of the gland-ducts which discharge themselves into the alimentary canal are acted upon and contribute to the resulting diarrhœa.

Illustrations of metaphoric language derived from the connection between the emotions and the viscera have already been given in the chapter on Sensation, but we may add here one (rumination) having more particular reference to muscular action. Thus, Shakespeare, in 'Henry VI':—

"I may revolve, and *ruminate* my grief."

ACT V, SC. 5.

This appears to be the proper place to refer to those cases of icterus, which probably arise from spasm of the gall-duct. Dr Watson says, "Certainly the *pathemata mentis* play their assigned parts; fits of Anger and of Fear and of alarm have been presently followed by jaundice. . . Mr North witnessed a case in which an unmarried female, on its being accidentally disclosed that she had borne children, became in a very short time yellow. A young medical friend of mine had a severe attack of intense jaundice, which could be traced to nothing else than his great and needless anxiety about an approaching examination before the Censor's Board at the College of Physicians. There are scores of instances on record to the same effect." Dr Watson seems inclined to connect the icteric and mental symptoms with spasmodic constriction of the gall-ducts, and does not adopt Mr Mayo's suggestion that jaundice in such cases is due

to the influence propagated through the nerves causing the formation of bile in unusual and rapid amount in the blood (lxxii, ii, p. 557).

Shakespeare recognises the truth of the occurrence of icterus in consequence of mental states, in the "Merchant of Venice:"

"Why should a man, whose blood is warm within,
Sit like his grandsire cut in alabaster?
Sleep, when he wakes? *and creep into the jaundice*
By being peevish?"

ACT I, SC. I.

Probably peevishness would be more likely to cause jaundice by acting directly on the secretion of the liver than by causing spasm of the gall-duct.

In the 'British Medical Journal' for Nov. 19th, 1870, is the report of a case of "Jaundice after Anxiety," by Mr T. Churton, of Erith:—

"A married lady, æt. 30, had an attack of jaundice, October, 1868, after mental and physical fatigue. The ordinary remedies were used, the nitro-muriatic acid being the most useful, but the discoloration persisted for some weeks. Six months afterwards she had another attack, which appeared to arise from similar causes. She had several visitors staying in the house, and having little inclination for society, was somewhat disturbed by attending to them, and by the addition to the ordinary cares of the household. In the midst of this anxiety, one of her children, subject to asthma, had a severe attack one evening, and was in considerable distress all night. Next morning at five o'clock, I found her sitting up in bed, rocking to and fro, and complaining of acute pain in

the hepatic and gastric regions. Pulse 72; temperature 98.4° . She showed slight but unmistakable symptoms of hysteria—quivering eyelids, &c. Ten grains of bromide of potassium were given, therefore, every four hours. The first dose cured her of all pain at once. On the following day, however, I found her completely jaundiced, and the urine of a dark brandy colour. The bromide was continued, but less frequently, and an aperient given. Next day the jaundice was less intense. Two days after, the yellowness had entirely gone, and the urine was of a natural colour.”

Mr Churton adds,—“I do not pretend that the aperient pill had nothing to do with this rapid recovery, but, on the other hand, we know how little purgatives avail in such cases. Neither do I think they would have availed anything in this case, had not that condition of the nerve-centres upon which (no matter how) the jaundice ultimately depended, been first, as it were, neutralised by the bromide. Nevertheless, I should have laid little stress on a single case, but that Mr Jessop, of Leeds, to whom I am indebted for the suggestion of this plan of treating nervous jaundice, tells me that he has several times used the bromide with equal success.”

Ureters, Bladder, and Urethra.—We shall only notice here the familiar effects of Fear, &c., in causing spasm of the expulsor muscle of the bladder and inducing urgent micturition. The following is given by Romberg as an example of spasm of the bladder from the fear of approaching death:—“A Judge of the Criminal Courts related to me that a man, convicted of highway robbery and murder, who was executed some years ago in the town,

before mounting the scaffold, prayed to be allowed to gratify the urgent desire to micturate." He adds, "Even certain mental impressions are capable of inducing a greater inclination to frequent contractions of the vesical muscles, as in other instances they affect the muscular fibres of the rectum. We occasionally meet with hypochondriacal patients who think of nothing else but the state of their evacuations. I have had a gentleman of this description under my care, who always remained in the vicinity of his house when he took a walk, in order to be able at once to follow the call of nature. There was another who had heard that the formation of calculus could be prevented by frequent micturition; after the impression had ceased to harass him, he was still often reminded of it by an annoying sense of strangury" (xxxiv, ii, p. 31).

Sir James Paget was consulted in no less than four instances, within the fortnight following the demise of Napoleon III, by persons who experienced sensations of stone in the bladder, without there being any calculus, probably from spasmodic action of the viscus (xlix).

Uterus.—Under this head we shall only refer to the fact familiar to every general practitioner—the influence of violent emotion in causing miscarriage, and of arresting uterine contraction in labour. Hence, if an accoucheur leave his patient and another take his place, the progress of labour is generally impeded; uterine contraction ceasing for hours. Yet medical men often strangely forget the importance of avoiding unpleasant mental impressions under such circumstances. I have known an accoucheur, devoted to natural history, improve the occasion by coolly

bringing out of his pocket an adder which he had just secured in one of his country walks. I believe the patient did not find the exhibition so useful as to make her particularly desire to have the same medical attendant again.

In a case recorded by Professor Laycock (iv, p. 112), Attention and emotional excitement combined, brought on uterine pains in a female, æt. 48, who was attending her daughter during a very tedious labour.

Dr Gooch records the case of a lady whom he attended, who with great difficulty was persuaded to marry, in consequence of an imagination that she would certainly die should she become pregnant. Such was the influence of this apprehension upon the course of the labour, that, in spite of all the encouragement Dr Gooch gave her, it interfered with its progress in so marked a manner as to protract it to a period of thirty-six hours.

The death of the Princess Charlotte, acting on the imagination of women similarly circumstanced, injuriously retarded labour in many instances. Dr Gooch's practical conclusion is, "In this state of mind we must keep up the spirits of our patient, both during pregnancy and at the time of labour, by anecdotes of the most favorable accouchements of those who have entertained equal apprehensions, and by every species of encouragement in our power" ('A Practical Compendium of Midwifery,' p. 181).

CHAPTER X

INFLUENCE OF THE EMOTIONS UPON THE ORGANIC
FUNCTIONS

THE emotions powerfully excite, modify, or suspend the Organic Functions, causing changes in nutrition, secretion, and excretion, and thereby affecting the development and maintenance of the body.

We have in the consideration of the influence of the emotions upon the heart and blood-vessels anticipated, to some extent, the principles which underlie the phenomena of organic life referred to in this chapter. The important part played by the vaso-motor nerves has been dwelt upon, chiefly in connection with the vascularity of the skin, which so manifestly results from emotional excitement. The circulation of the blood through the various organs of the body being affected by the same cause, the action of the emotions in inducing well-marked changes in nutrition and secretion is not extraordinary. The question which arises, whether these variations in the circulation of the blood in the organs and tissues adequately account for the alterations in nutrition and secretion which follow, has already been fully considered, and the conclusion been arrived at, that varying mental

states may act upon these processes directly through the nerves as well as through the capillary circulation.

Blood.—Pleasurable emotions by their influence on the heart and respiration favour oxygenation of the blood; and we are all conscious of the

“Sensations sweet
Felt in the blood, and felt along the heart.”

depressing emotions producing the contrary effect.

Not that we suppose sensation to be actually appreciated by the blood, but that the sensation which is undoubtedly experienced has its seat in the walls of the vessels, that is, is vaso-sensory.

The direct influence of emotional excitement upon the blood itself has been supposed to be exhibited in the case recorded by Hunter—that of a man who died in a fit of passion, and in whom it was found fluid, but more proof is required that the two stand in causal relation. Dupuy's experiments on animals (after being hunted), adduced to show that mere rapidity of the circulation diminishes the fibrin in the blood, have not been confirmed by more recent observers. On how many occasions does active bodily exercise in man inordinately quicken the circulation, without any bad effect as regards the blood! Dr Wilks (xlv, Feb. 1st, 1868) observes, “We hear sometimes of fear turning the whole mass of the blood. I believe this is literally correct. I have seen now so many cases of anæmia, some of them fatal, occurring upon a severe shock of the nervous system, that I have no doubt of the fact.” He then refers to the *modus operandi*, but frankly confesses his ignorance until physiologists will inform us in what part of the body the blood is manu-

factured. Those who explain everything by the varying calibre of the blood-vessels, would fully admit that mental states influence, not only the amount of the blood in a vessel during a given period of time, but also thereby its chemical composition. Cl. Bernard tries to prove, experimentally, how the nervous system controls (and therefore how Emotion may influence) the absorption of oxygen by the blood in the lungs, and its combination with the histological elements of the tissues. As his experiments on the relation of secretion to the blood prove that, during this process, the blood in the veins of the glands, which is usually dark in colour, becomes of a bright arterial scarlet, and as he accounts for these phenomena by the opposite action of the two classes of nerves—the contracting and dilating—which supply the vessels;—results which may be artificially induced by *section* and *galvanism*—it follows that even if we go no further than Bernard's mechanical views, varying emotional states would affect the relative amount of oxygen and carbonic acid gas in the blood. As the transformation of the effete materials of the tissues, taking place in the capillaries, requires time, and therefore a certain stagnation of blood for the operation, if the emotions interfere with this condition, it is easy to see that there will be a tendency for arterial blood to pass unchanged into the veins, as actually occurs when the sympathetic nerve is divided. Changes of psychological origin in the quantity and quality of the blood, and consequently in secretion and nutrition, may thus receive at least a partial explanation by our application of Bernard's experiments. Increase of temperature, and thereby of certain chemical phenomena, must

also be included. That changes in the chemistry of the blood may, however, be produced in a more direct manner is, to say the least, very probable.

The question of the changes produced in the blood by certain conditions of the mind, obviously bears upon the alleged *influence of the mother upon the embryo*. While the evidence in regard to it is far from being so complete as we could wish, it is certainly sufficient to raise a strong presumption in favour of the action of mind upon blood in this instance. If the effects are granted, the inference that the blood is the channel through which they are produced appears the only legitimate one, so long as no anatomical proof is forthcoming that there exists any connection between the nervous system of the mother and the fœtus in utero. Since Bichat wrote, nothing has been discovered to disprove his position that "it is by the modifications which the mother's blood receives from vivid emotions that we must explain their influence upon nutrition, the growth, and even the life of the fœtus, to which the blood is supplied through the placenta" (li, p. 43).

What may be the extent and character of this influence, is, however, a question on which much difference of opinion exists, and many appear unable to see any alternative between admitting all the absurd stories about "mother's marks," and denying maternal influence altogether.

A few cases recorded by medical observers may here be briefly alluded to, for the purpose of illustrating the point at issue.

1. In the 'Lancet' of November 7th, 1868, Mr Child late House-Surgeon of Charing Cross Hospital, recorded

a case illustrating, he considers, the influence of "maternal impression." The child was born August 26th, 1868, and was naturally formed, as regards the body, except the nails on the thumbs, which were like those of a rabbit. "The parietal, frontal, and part of the occipital bones were wanting; and at the space corresponding to, but larger than the anterior fontanelle, was the brain, entirely denuded of skin or membrane, not even being covered with arachnoid. There was a little hair over the eyes, none elsewhere. The eyes, palate, and tongue were similar to those of a rabbit." Mr Child then found that during the second month of pregnancy the mother went to a penny show, in which she saw a trained horse pull the trigger of a pistol, pretending to shoot a rabbit. A dummy was then thrown out; the back of its head was bleeding, having to all appearance been shot off. This corresponded, as the mother-in-law declares, to the mark on the child's head. The patient seems never to have forgotten the circumstance during the remainder of her pregnancy, and was considerably frightened at the time.

2. In the 'Lancet' of August 17th, 1867, Mr T. Smith, Surgeon to St. Bartholomew's Hospital, in a paper on "Mother's Marks," observes that "one cannot doubt that these marks occasionally appear on children in connection with mental impressions received by the mother during pregnancy." He then adds: "I will show you a striking case that came under Mr Paget's observation. This child was admitted into St Bartholomew's Hospital in 1865. She was at that time twelve years old. The left upper extremity and the greater part of the correspond-

ing side of the trunk and neck were deeply stained with dark brown pigment, from which grew an abundant crop of brown, harsh, lank hair, varying in length from one to two inches. The skin was rough and harsh; the arm was long, thin, and withered; the scapula was unnaturally prominent. In fact, the upper limb, shoulder and back, bore a very strong resemblance to the corresponding part of a monkey. The mother stated that when three months pregnant with the child she was much terrified by a monkey attached to a street-organ, which jumped on her back as she was passing by." Mr Smith concludes his report by the remark, "I need scarcely say that such a case does not stand alone. There are many well-authenticated cases where marks and even bodily deformities in the foetus, can be fairly attributed to strong and persistent mental impressions in the mother."

I am indebted to Dr A. J. Alliott, of Sevenoaks, for the following case :

3. Mrs A—, is the wife of one of the officers at a large country asylum. J. W—, is a patient in the same asylum, working in the stores, and disfigured by a large nævus patch, of a fiery-red hue, which covers the whole of the right side of the face. Mrs A—, had, of course, frequent opportunities of seeing this man at the Sunday Chapels, and on other occasions; during her last pregnancy she entertained a feeling of horror and disgust at his appearance. On the child being born, the first question she asked was, "Is he marked at all like that man?" (J. W.) The answer was "No, as far as can be seen at present." On examination the next day, however, a distinct nævus patch of the size of a threepenny piece was observed on

the left upper eyelid, and later on, several nævus growths on the vertex and back of the head from the size of half-a-crown to a shilling; the child (a female) has at present a thick head of hair, so that these patches are well concealed. Mrs A. had a tedious recovery after her labour, and told me she had been fretting herself so much about this man's appearance, that she thought about it night and day. Her other children, two girls and a boy, are of a fair skin and quite free from any blemish.

Cases like these would appear to countenance the conclusion that the Imagination of the mother, united more or less with Emotion, produces corresponding effects upon the unborn child. The number reported by various medical men is large, and undoubtedly deserves consideration. The shallow objection that such effects of the maternal imagination are impossible, is easily, and (for this reason) frequently made. On the other hand, it must be admitted that these reports ought to be received with great hesitation, not from there being any reason to doubt the good faith of the reporters, but on account of the peculiar liability which obviously exists to colour the the facts, and make them square with a preconceived theory.

Coincidence may fairly be allowed to explain some of these occurrences; what more likely, for instance, than that out of the considerable number of children born hydrocephalic or acephalic the mother of one should attend a fair, see an exhibition of monstrosities, and be affected disagreeably during the time of her pregnancy?

Further, it must be borne in mind that there are a very large number of instances in which accoucheurs have

carefully noted the expectations of the mother before delivery, without the slightest fulfilment of such expectations in any corresponding bodily affection of the child.

Thus Dr Fisher, in the 'American Journal of Insanity' (Jan., 1870), says that during twenty years he has made a practice of asking his patients whether they expected any deformity in the child, and by far the larger number expressed their fear of such a result, and frequently specified the nature of the deformity; and yet only two cases of malformations occurred during this period, and these did not appear to be in any way connected with the longings, &c., of pregnancy. He speaks of 1200 cases, and maintains that Dr Hammond has failed to prove his position that maternal states cause malformations. Hunter also made inquiry in 2000 cases before the birth of the child, and failed to find in a single instance any connection between a mental emotion in the mother and an abnormal development of the child.

However, although we may not be prepared to accept the evidence in favour of the production of special marks in the fœtus answering to definite mental images in the mother, it is probable that a serious mental disturbance of the latter will indirectly affect the nutrition of the former.

The effects of emotion on nutrition being necessarily of a general character, their phenomena do not strike us in the same way as do the changes in the nervous and vascular systems produced by the same agency, but they are not the less real as may be seen by the bodily contrast between the man who spends his life in tranquillity and the man who passes it in mental misery.

Bichat (writing in 1800) recalls and contrasts the time

when Fear, Sadness, and the desire of revenge seemed to hover over France, with that in which security and abundance excited the gaiety so natural to his countrymen, and points to the difference in the exterior aspect of their bodies in proof of the influence of the emotions on nutrition. I know several interesting examples of the same influence as the result of the late war in France.

A lady informs me that at Tours many lost their health, and some died from fright. A young lady was standing with her father at the window when the Prussian soldiers came down the *tranchée*, and was seized with shivering; her father who could feel her trembling, said—“You need not be frightened, they will not hurt you;” but she had received a shock from which she became quite blanched, and lost her sleep and flesh. She has not yet fully recovered her strength, and remarks that she has never been able to keep her feet warm since that day (1872).

Dr Boggs, in a letter to the ‘Lancet,’ dated June 21st, 1871, writes:—“The only hope of the Parisians which they fondly cherished, and which, in a great measure, kept them alive during the siege, was most cruelly blighted, and you may imagine their disappointment when the capitulation of the city was announced; the mental shock to some was such that they almost lost their reason. . . . But the most remarkable effect of the siege was the aged appearance of some of the inhabitants; men and women alike seem to have passed over at least ten years of their existence in half as many months. A friend of mine, a distinguished practitioner in this city, nearly fifty years of age, has become so gray

and wrinkled, and such other changes have taken place in his constitution, as to give him the appearance of a man of sixty."

The influence of a violent and painful emotion on nutrition is well shown in the following well-told case:—

"Returning from a professional visit late one evening, I was met by a medical friend who begged me to see with him a gentleman whom we both had previously well known, stating that he was in a deplorable state and wished to see me. I at once consented, and we walked on together. "You have, of course," said he, "heard of his unfortunate accident." I said I had heard some vague reports of his having shot some gentleman accidentally. "Alas," said he, "that was not all. You must remember him, one of the handsomest young men in the university." I said, "Yes." "Wait until you see him now; he is truly a victim to mental distress; his form is reduced to a skeleton, and his strength scarce that of an infant's. The circumstances are these:—He was spending the shooting season at his uncle's in ——shire, when his cousin, to whom he was much attached, about his own age, and an only child, irritated him by some frivolous remarks while on a shooting excursion; words ran high on both sides, and they being only attended by a little boy of ten years old, who could not interfere, a struggle ensued, in which the poor victim we are going to see, shot his cousin on the spot. He then returned, scarce conscious that he did so, to his uncle's house, detailed the events, from the effect of which within a month he saw his uncle and aunt carried to their graves, while he exists a miserable wreck, soon to follow them."

“Such as he was described I found him : his hand was hot and feverish ; his cheek pale and withered, and his frame a perfect skeleton ; his voice was deep and hollow, and his expression agonized and wretched, yet he complained of nothing. It was clear that his nervous circulation was suspended ; yet his thinking principle was awake, and consciousness alive. The mental or nervous stimulant was withdrawn, having by the shock of the accident been directed into another channel, which was necessary to keep in activity the animal functions, and a general stagnation ensued, until exhausted nature sank from inanition ’ (xli, p. 50).

Of the disastrous influence of disappointment in love in causing mal-nutrition in the form of pulmonary disease, I may refer to the case of a young lady, the daughter of my old French master M. de M—. I avail myself of the graphic pen of a well-known writer, “Holme Lee,” to describe this case, and shall not apologise for introducing so florid a sketch into a medical work :—

“There is his grave, and his darling Vic’s close by it, in the quiet churchyard behind the arches of the Abbey, tufted greenly over ; but to-day all white and daisied with the spring. What a bright face it was, that face of Vic’s, which just faded and faded and died away from the sun, in the very prime of the morning ! Here is a picture of a brilliant August day out of doors ; but in the Professor’s study all is grave and quiet, and the long table is cleared for the incoming class. There is sturdy little Fan, just on a comfortable level with her books ; and pretty Vic, who has attained to the dignity of helping her father, seated with her back against the light, and the roses of

her cheeks all in full glow under the shadow of the dark grape-clusters of her richly tinted hair. She rests her elbows on the big dictionary, and props her dimpled chin in the palms of her wee white hands, on one finger of which gleams an emerald ring—symbol that her heart is given away and her maiden promise plighted already. The door opens, and two scholars enter with mysterious air and abrupt news. ‘There’s a wedding at St. Olave’s this morning; have you heard of it, Vic?’ cries one. ‘We always thought you and Willy were engaged; did you really break off when you quarrelled? It *is* that widow! she has nothing but her money. I would not care if I was you, Vic; he was never worth caring about!’ And then the chatterer subsides into a frightened silence, *for out of Vic’s face die away the roses and the sunshine, as if the hand of Death had passed over it and turned it to clay. Not a word breathes from her white lips; they only stir with a dumb fluttering pathos, while a blank gaze steals over her beaming hazel eyes and quenches their lustre for ever.* No one ever saw Vic smile again. She does not help her father that morning, and he is a little testy over our lessons; he will have the window shut, sultry as it is; for we can hear the wedding-bells ringing at St. Olave’s while we are gathered at our work. Her mother has told him hurriedly Vic is not well, and he must do without her, and he is fidgety and fretful that anything should ail his darling and he not know why. He will know why soon enough—soon enough!

“And this is a day in the fall of the leaf. The chill October winds have begun to blow, and Vic is sitting by our parlour fire, at home, talking to my eldest sister very

seriously and sadly, myself listening with an awed, silent sympathy to the old, old story she is telling; I fancy I can hear her still! 'Yes, they had quarrelled, but had made it up again, and she thought it was over; he kissed her the last time they said good-bye; they were quite friends. Oh, yes, quite friends! She had no more idea of his leaving her, and marrying anybody else, than she had of the Minster falling! Her grief would kill her, *is* killing her—her heart is broken' she says; speaking not in her old sweet voice, but in such a querulous sharp accent as might thrill from the chords of some fine instrument when overworn, and jarred all out of tune. She had her pretty caprices in her happy days, and perhaps by practical people she may be considered a little fantastic and sentimental now; but by-and-by every adverse tongue is hushed, for it begins to be whispered amongst us *that she is going off in a decline*. And before the snow-drops come again she is gone" ('In the Silver Age,' 1866, p. 140).

Hunter considered that nothing shows the influence of the Mind upon the Body more strongly than the effect of maternal anxiety in a hen when hatching. "A hen shall hatch her chickens, at which time she is very lean; if those chickens are taken away from her she will soon get fat, but if they are allowed to stay with her she will continue lean the whole time she is rearing them, although she is as well fed and eats as much as she would have done if she had had no chickens" ('Posthumous Papers,' vol. i, p. 261).

Care, it is said, will kill a cat; and its effect, as regards man, is too patent to need illustration. As pointed out by

Fletcher, the convict may grow fat even on prison fare, simply because his doom is sealed and he has no anxiety. When considering the influence of the emotions upon the blood-vessels, we showed that all the signs of those changes in nutrition which are comprised under the term "inflammation" may be so caused. We proceed now to give illustrations of definite lesions of nutrition, as observed in the changes which frequently take place in the *skin* and *hair*.

As, without actual disease, we see the influence of mental causes upon the functions of the skin, Fear checking perspiration, and other emotions causing temporary congestion, it is not surprising that definite eruptions should occasionally have a similar origin. The transition to eczema, impetigo, &c., may be difficult to understand, but is it not possible ?

Mr Hutchinson informs me, in connection with his experience at the London Skin Hospital, that patients frequently attribute the affections of the skin under which they labour to fright and other moral causes ; but I have not been able to obtain any statistics. The relation between some cutaneous diseases and the distribution of nerves bears upon this subject. The instance of shingles has been already referred to in connection with the nerves engaged in nutrition. When severe neuralgia is followed by herpes in the course of the affected nerve, we can hardly doubt the possibility of distress of mind occasioning this cutaneous disorder, though we cannot prove it.

A lady, of an exceedingly sensitive and irrepressible nature, on one occasion when a gentleman visited her house experienced a very uncomfortable sensation so long

as he was present, and observed a spot or sore on his cheek. Two days after, a similar spot appeared on her cheek, in the same situation. So reports the late Professor Gregory (xix, p. 507). I see nothing impossible in this; at the same time, it can hardly be admitted, if a solitary example, to prove the influence of mental states on the skin.

Ovid gives expression to a similar notion when he says :

“Dum spectant oculi læsos, lædantur
Multique corporibus transitione nocent.”
DE REMED. AMORIS, lib. ii, v, 320.

“Viewing sore eyes, eyes to be sore are brought,
And many ills are by transition caught.”

Cazenave, when enumerating the causes of skin-diseases, remarks that “strong mental emotions, and Grief in particular, exercise a remarkable influence.” Speaking of impetigo, he says that Grief and Fear sometimes produce the disease. Bateman mentions two cases in which great alarm and agitation of mind caused this affection.

In his lectures, M. Biett used to relate to his pupils several cases which showed this influence. In particular he referred to a striking example exhibited in a very severe form of *lichen agrius*, occurring within twelve hours of the receipt of unwelcome intelligence. In the ‘Medical Times and Gazette,’ July 13th, 1867, the case is reported of an engineer who, treated for syphilis, from which he remained free for six years, became, a week after hearing of the fall of a bridge he had built, the subject of

“syphilitic impetigo of the scalp and beard.” Gratiolet observes that Melancholy dries up the skin and induces a number of herpetic affections.

Guislain mentions two cases bearing on this subject; one in which a woman, who had seen her daughter violently beaten, and was much frightened, suffered in consequence from gangrenous erysipelas of the right breast; the other in which a woman, æt. 24, saw her brother die, and was greatly affected. A wen which she had on the head became gangrenous in a few days. “L’odeur qui s’en dégageait le décélaît suffisamment” (‘Leçons Orales,’ p. 166).

In connection with the influence of the emotions upon nutrition, its generally recognised effect in inducing cancer should be mentioned, a predisposition in the system being probably necessary. Descuret reports the case of a young woman who had cancer of the breast requiring operation, which he attributes to the maleficent action of Jealousy, Hatred, and Chagrin (lxvi, p. 621). Romberg says he attended a lady, æt. 40, whose right mamma had four years previously, after violent mental excitement, become attacked with scirrhus, which was being gradually developed (xxxiv, i, p. 150). Such examples must, however, be received with great hesitation. Their mental origin requires the confirmation which can only be derived from very many more instances.

Hair.—The influence of Grief or Fright in blanching the hair has been generally recognised.

“For deadly fear can Time outgo,
And blanch at once the hair.”

It has been a popular rather than a physiological belief

that this can occur "in a single night." No one doubts that the hair may turn gray, gradually, from moral causes, and this is sufficient proof of the mind's influence upon the nutrition of the hair. I have known alternations in the colour of the hair (brown and gray) corresponding to alternations of sanity and insanity. Some entertain doubts as to sudden blanching of the hair, but I do not believe them to be well founded, and will give in illustration the following interesting case which occurred in the practice of my late friend Mr W. P. Cocks, of Falmouth:—

Thomas W—, about 20 years of age, the son of a milkman, was tall, fleshy, good-looking, slightly bronzed, hair intensely black, stiff, wiry, and rather inclined to curl. His general appearance was that of a healthy and well-formed man, used to light-work, but much exposure in the open air. One of his thoughtless companions told him (what was not true) that a young woman in the town was going to swear before the magistrate, on the morrow, that he was the father of her child. Poor W— was dumb-founded. The announcement had given his whole frame a severe shock; the gall of bitterness had entered his heart, and the mind was under the baneful influence of its power. He hastened home, and sought relief in his bedroom. Sleep was denied him, for his brain was on fire. He saw nothing but disgrace coming from every angle of the room. Such was the mental agitation produced by a silly trick! Early morning brought no relief; he looked careworn, distressed, and his hair was changed from its natural tint to that of a "light iron gray colour." This to him was a great mystery. In the course of the following day the stupid

trick was explained, but the ill effects of it lasted for a long period. Nearly twenty years after, although his health was fair, the mental powers retained signs of the severe shock they had received; his hair was perfectly gray, and it was but too clear that he would carry the marks of this folly to his grave.

I know of a captain of a vessel, under forty years of age, who suffered shipwreck twice. On the first occasion (in which he lost all hope) his hair quickly turned gray; and on the second, some considerable time afterwards, his hair became still further blanched. He resolved never to go to sea again, and kept his resolution.

Bichat, opposing the scepticism of Haller, asserted that he had known at least five or six examples in which the hair lost its colour in less than a week: and that one of his acquaintance became almost entirely blanched in a single night, on receiving some distressing news. There is no reason to call in question the statement that Marie Antoinette's hair rapidly turned grey in her agony. We have it on the authority of Montesquieu himself that his own hair became grey during the night, in consequence of receiving news of his son which greatly distressed him. Dr Laudois, of Griefswalde, reported not long ago a case in 'Virchow's Archives,' in which the hair turned rapidly white. But I have not any particulars at hand beyond the fact that on carefully examining the hair, he found that there was "an accumulation of air-globules in the fibrous substance of the hair." Sir Erasmus Wilson read a paper at the Royal Society in 1867 on a case of much interest, a *résumé* of which I subjoin in a note.*

* Every hair of the head was coloured alternately brown and

M. Pouchet who has collected a number of instances of hair-blanching writes:—"The careful experiments made by an eminent physiologist, M. Brown-Séguard upon himself, leave no room for doubt that a few hours suffice for the hair to be filled with minute globules of air and to become snow-white. Dr Cassan has reported the history of a lady named Leclère, who was brought before the Chamber of Peers to give evidence in the trial of Louvel and who underwent in consequence so serious white from end to end. The white segments were about half the length of the brown, the two together measuring about one third of a line. Sir Erasmus Wilson suggested the possibility of the brown portion representing the day growth of the air, and the white portion the night growth, and this opinion was corroborated by the remarks of Dr Sharpey and others of the Fellows who took part in the discussion. Under the microscope the colours of the hair were reversed, the brown became light and transparent, the white opaque and dark; and it was further obvious that the opacity of the white portion was due to a vast accumulation of *air-globules*, packed closely together in the fibrous structure of the hair, as well as in the medulla. There was no absence of pigment, but the accumulation of *air-globules* veiled the normal colour and structure. Sir E. Wilson observed that as the alteration in structure, which gave rise to the altered colour, evidently arose in a very short period, *probably less than a day*, the occurrence of a similar change throughout the entire length of the shaft, would explain those remarkable instances of which so many are on record, of sudden blanching of the hair; and he ventured to suggest that during the prevalence of a violent nervous shock the normal fluids of the hair might be drawn inwards towards the body, in unison with the generally contracted and collapsed state of the surface, and that the vacuities left by this process of exhaustion might be suddenly filled with atmospheric air (xlvii, April 20th, 1867). Perhaps it would be more easily explained by supposing an arrest of the supply of the nutrient fluids, preceding the entrance of *air-globules*.

a perturbation that in the course of one night, her hair turned completely white. We have the still more decisive and interesting observation of Staff-surgeon Parry in India. It refers to a rebel sepoy, caught by the English troops in 1858, who was about to be shot. All at once a soldier perceived that the hair of the captive was becoming grey, and called the attention of the surgeon to it; the latter was able to observe the progress of the discoloration which became complete, during the time (about half an hour) he was being interrogated. The Dutch physician Junius reports that a Spanish gentleman surprised in a convent and condemned by Ferdinand the Catholic, to be beheaded, had his hair blanched in the night which followed his condemnation. The King of Castile would in pity, have even remitted the capital punishment, in consequence. A similar event happened to Ludovic Sforza the day he fell into the hands of Louis XII; and to the Seigneur de Saint-Vallier the father of Diane de Poitiers; but it was not to his grey hairs that he owed his life. Henri IV used to relate that, when on Saint Bartholomew's day he rested twenty-four hours after his fatigue, his head reposing on his hands, his beard and hair became white from the chin to the temples where his hands had been. It is said that the Sieur d' Andelot, compromised in the affair of the Counts Egmont and Horn, and punished by his brother Peter, remained many hours with his head resting on his hands; and with him also when he rose, a part of his beard and of his eyebrow on the same side, had become blanched. The most touching of all such histories is that of Guarini the professor of Greek at Verona, one of the purest

spirits of the *renaissance*. According to Virunio, the hair of Guarini turned suddenly white on receiving intelligence of the loss at sea of a box of manuscripts which he had himself gone in search of at Constantinople. Is not all the renaissance figured in this little circumstance? Greek manuscripts lost! That was more than a domestic bereavement, more than a public calamity, it was a catastrophe for all the world! ("Revue des deux Mondes" 1872 p. 79).

M. Pouchet illustrates the fact that nervous influences thus affect the pigment, by the effect produced on animals by section of nerves, and the consequent absence of colour in the area supplied by the nerve-force. Thus if a turbot displaying the black spots, be so treated and be thrown into an aquarium with a sandy bottom, the whole body becomes pale, except the region which no longer receives the cerebral influence. The nerves are very simple and accompany the arteries. If two or three of these nerves about the middle of the body of the turbot are divided, it has the effect of marking on the skin a black transverse band in the course of these nerves; if the nerve supplying the face is cut, the turbot which is becoming pale upon the sand presents a black mask having the most singular effect. The turbot, it must be remembered, living in the sand, presents a grey colour which can hardly be distinguished from it, but if anything approaches it, large black spots immediately appear. This is also illustrated in Lister's researches on the pigment cells in the skin of the frog.*

* Sir Robert Heron, Bart., states:—"A black Poland cock belonging to my neighbour, Mr Kendall of Barnsley, was attacked last

The falling off of the hair is too frequent a result of anxiety or other depressing emotion to escape common observation. A case reported in the 'Lancet' of May 4th, 1867, forms an excellent illustration:—

A man of nervous temperament began business as a draper in 1859. At that time he was 27 years of age, in good health, though not very robust, unmarried, and had the usual quantity of (dark) hair, whiskers and beard. For two years he was in a state of *perpetual worry and anxiety of mind*, and his diet was very irregular. Then his hair began to come off. He declares that it literally fell off, so that when he raised his head from his pillow in the morning, the hair left on the pillow formed a kind of cast of that part of his head which rested on it. In a month's time *he had not a single visible hair on any part of his body*—no eyebrows, no eyelashes; even the short hairs of his arms and legs had gone; but on the scalp there could be seen, in a good light, patches of very fine short down. This was in 1861. Medical treatment proved of no avail, and he was finally advised to do nothing. So long as his anxiety continued, the hair refused to grow, but by the latter part of 1865, his business became established, and, coincidentally, his hair reappeared, and when Mr Churton, of Erith, reported the case, he had a moderately good quantity of hair on the head, very slight whiskers, rather better eyebrows, and the eyelashes pretty good.

winter, near the house, by a fox, but his screams being heard by the servants, he was rescued, desperately wounded, with the loss of half his feathers; in time the remainder of his feathers came off, and he has now become perfectly *white*." (*Proc. Zool. Soc.*, 1835.)

The influence of painful emotions in causing gray or white hair, and alopecia, has been sufficiently illustrated, and it would have been interesting to adduce a reverse series showing the opposite effects of Joy. But it is a very different thing to restore to its healthy habit, the function of a tissue whose pigment has been removed by slow mal-nutrition, or by sudden shock. If we credit, however, the following circumstance, described to me by the same medical man who attended Thomas W— (p. 80), it shows that hair which has turned gray in the natural course of life, may by the stimulus of specially favorable events, become dark and plentiful again.

An old man (æt. 75), a thorough out-and-out Radical—even the cancelli of his bones were so impregnated with a thorough disgust of the Government of George the Fourth that he threw up a lucrative situation in one of the Royal Yards, and compelled his youngest son to follow his example—insisted that his wife, also aged (about 70), toothless for years, and her hair as white as the snow on Mont Blanc, should accompany them to the land where God's creatures were permitted to inhale the pure and invigorating atmosphere of freedom. About six or seven years after their departure, a friend living in New York gave an excellent account of their proceedings. Not only could the old man puff away in glorious style, and the son do well as a portrait painter, but old Mrs — had cut a new set of teeth, and *her poll was covered with a full crop of dark brown hair!*

Doubtless the apparently new set of teeth must be explained by the exposure of stumps in consequence of the shrinking of the gums. At least we trust no scep-

tical reader will suggest an artificial set, or if he does, that he will not proceed further and challenge the growth of hair by hinting at a wig. It would be a pity to spoil a good story, introduced here with the considerate intention of enlivening an otherwise dry record of facts.

Teeth.—In reference to the nutrition of the teeth, I must content myself with a single example of the effect produced by unfavorable emotional influences. “I have recently known,” says Marshall Hall, “the teeth to decay in an extraordinary manner in a few weeks, as the effect of painful emotion, more allied to Fear than any other” (xvii, p. 40). Of course, such a statement without a knowledge of accompanying circumstances which might tend to the same result must be taken for what it is worth, but I have no reason to doubt the alleged effect.

CHAPTER XI

INFLUENCE OF THE EMOTIONS UPON THE ORGANIC
FUNCTIONS (*continued*)

PASSING on to the influence of the emotions on *Secretion*, we commence with the sudoriferous glands.

Sweat.—The ordinary action of mental excitement in accelerating the cutaneous circulation and secretion is familiar enough. The state of the system may be aroused by painful, no less than by pleasurable emotion. For example: when Warren Hastings was thrown into a passion by his recall home, we are told that “the sweat ran down his face” in an extraordinary manner. Of interest in connection with an experiment of Cl. Bernard, in 1851, which showed that division of the cervical branch of the sympathetic in the horse caused increased perspiration on the corresponding side, is the record by Gratiolet of a case in which emotional excitement had the effect of causing the perspiration of the head to be afterwards limited to one side. The sweats of terror are cold. The vaso-motor nerves are so influenced as to cause the capillaries to contract, the temperature is lowered, and insensible is converted into sensible transpiration. If the amount is actually increased, there is probably an escape of fluid rather than augmented secretion. Checking of secretion

is seen in emotional anasarca. Many medical authorities have referred to the fact of anasarca following violent emotion of a painful character (innervation lowered). Bateman witnessed the extraordinary influence of alarm upon a poor woman; a sudden universal anasarca following, in one night, the shock occasioned by the loss of a small sum of money, which was all she possessed ("On Cutaneous Diseases," p. 150). Copland classes such cases under "primary asthenic anasarca;" the vital tone of the small vessels being lowered, the excretory function of the skin is suspended, and serous effusion from the blood-vessels follows. Why, in some, this serous effusion remains in the cellular tissue, and in others is poured forth through the ducts, it is difficult to say. Possibly spasm of the ducts may have something to do with it. In the following instance, related to me by Mr Cocks, a very large amount passed away through the ducts; and it becomes a question whether Fear in this case did not act simply in exciting the sudoriferous glands to excessive action. The man's fear was of an anxious, fidgety kind, which was more likely to arouse than to check the function of the glands. Such a case is full of interest and instruction.

John Ford, an officer in the Royal Navy, in George III's time, was invalided home from the West Indies for dropsy. Twelve months afterwards he was discharged from the Naval Hospital as incurable, from which date to the time when first seen by my friend, he was under the paternal medical care of a host of ichneumons, who fed on the exchequer of his profits *secundum artem*. As to the disease, it was a matter of no moment—the longer

he lived to swallow their trash, the better for them. "They looked on and grinned, grinned and looked on again." Mr Cocks says he found him propped up in bed at an angle of 60°, with an anxious and cadaverous countenance. The room was neatly and profusely embellished, not with pictures, but with empty physic phials, pill boxes, and gallipots. He had been well drugged; his system was saturated with nearly nine tenths of the articles mentioned in the *Materia Medica*. My friend advised him to throw physic to the dogs, for the present, and to submit to the only remedy (in his case) to save life, a *surgical operation*, and that as speedily as possible. This roused him from his lethargy; it was like a powerful electric shock. Alarmed, he shook like a poor wretch under the influence of the cold stage of ague. In a subdued voice, he said (as his excitement partially subsided), "I never can submit to an operation; I would rather die!" "If that be your determination," it was replied, "your case may be considered hopeless; all the drugs in the world will not save you. At all events I will visit you to-morrow morning to know your decision." Accordingly Mr. C. called on him, but the scene was changed. Soon after his departure, he appeared to be greatly distressed both in mind and body; groaned aloud, wept much, and was very restless. The word "Operation" had worked wonders—in fact, a miracle. A copious *perspiration* was produced, and the steam like that from boiling water, issued from every pore in the skin. The nurse said that more than two gallons of fluid had passed from him during the night. The bedding, consisting of feather-bed, mattress, blankets and sacking, were satu-

rated through and through with serum, and the floor was flooded with it. The patient recovered, and was appointed to a ship in commission going to Jamaica. Two years after, he died from the effects produced by yellow fever, was buried in one of the "Campos santos," and was no doubt eaten by the land crabs in less than a week.

During the "sweating sickness" in the sixteenth century, Fear, as might be expected, frequently induced excessive action of the skin without the development of all the graver symptoms. "Many an one sweats for fear and thinks he has the English sweat, and when he afterwards hath slept it off acknowledges that it was all nonsense" (Bayer von Elbogen, lxix, p. 259).

Sometimes, however, on the mere mention of the subject "amidst a circle of friends, first one and then another was seized with a tormenting anguish, their blood curdled, and certain of their destruction they quietly slunk away home and there actually became a prey to death" (loc. cit.).*

Sir H. Holland records the case of a gentleman, æt. 36, and of good health, except that, "on the slightest exertion of speaking, eating, or emotion of mind, sweat broke out profusely in drops from the right side of the face, strictly defined by the median line, the other side remaining in its natural state. The complaint had existed four or five years, coming on without obvious cause" (xvi, p. 178). This unilateral condition is, when excited by such an essentially central disturbance as an emotion of especial interest, but it is difficult not to suppose that

* ".....animos omnium terrore perculit adeo ut multis metus et imaginatio morbum conciliarit" (Erasmus).

specific gravity. The late Dr Sutherland found a plus quantity of phosphates in acute maniacal paroxysms; denoting increased expenditure of nervous force, not inflammatory action. Also, a minus quantity in the stage of exhaustion of mania, in acute dementia, and in the third stage of general paralysis. Drs Sutherland and Rigby regarded these results as in harmony with analyses of the brain and the blood; a plus quantity of phosphorus being found in the brain, and a slight excess of albumen in the blood of maniacal patients, and minus quantities of these substances in the brain of idiots, and a minus quantity of albumen in the blood of general paralysis. These results have, however, been called in question, and we are disposed to regard some of them as still *sub judice*.

The influence of certain mental states, if prolonged, in causing diabetes appears to be proved. Watson specifies "distress and anxiety," and Copland "great mental exertion and the depressing passions." Claude Bernard's experiments on the vaso-motor nerves and the centres which control them, in explaining the pathological symptoms which arise from the changes induced in the nervous system by definite surgical lesions, show, also, how the emotions may produce the same results.

In Hebrew and Greek the kidneys are frequently employed in a metaphoric sense: "I was pricked in my reins," "my reins shall rejoice," "I try the reins," are a few of the many illustrations which may be cited from the authorised version of the Old Testament. In the New, the same metaphor is once made use of, "I am he that searcheth the reins," *νεφροί*. Parkhurst observes

in loco: "as experience shows that the workings of the mind, particularly the passions of joy and fear, have a very remarkable effect upon the reins or kidneys, so from their retired situation in the body, and their being hidden in fat, νεφροί is used in the New Testament for the most secret thoughts and affections of the soul." The latter suggestion is, I think, rather a doubtful one; however, whether correct or not, there remains the use of the word derived, manifestly, from the influence of the emotions, including the Imagination, upon the renal secretion, and perhaps, the lumbar region. It is rather remarkable that our language supplies no corresponding metaphoric term.

Saliva.—We have spoken of the influence of simple ideas upon the secretion of saliva under "Intellect," and will now refer to the alleged influence of Anger on the quality of this secretion.

It is interesting to observe that Bichat entertained no doubt that Anger and Love do inoculate the saliva with something "qui rend dangereuse la morsure des animaux agités par ces passions, lesquelles distillent vraiment dans les fluides un funeste poison, comme l'indique l'expression commune" (li, p. 43). The saliva of an enraged animal and the venom of a viper are, according to Eberle, essentially the same.

* In the 'Lancet' for July 14, 1860, is the report of a case of a boy, æt. 9½, who was bitten by a boy in anger. There was no evidence of rabies, but the boy died. He was seized with hydrophobia forty-eight days after the bite, and died in 24 hours. Trousseau quotes from Van Swieten the case of a young man who died of rabies after

having bitten his own finger in a fit of anger. Also that of an old woman who died with all the symptoms of rabies after she had received a wound from a cock in a passion. He observes that Van Swieten could not admit that a virus, which was not present in an animal, could by it be communicated, and, therefore, conjectured that the cock had been bitten by a mad fox. This seems rather far-fetched; but it is difficult to understand why anger does not more frequently affect the saliva, and poison those who are bitten by angry persons or animals. Of these cases, however, and in one cited by the same author from Malpighi, who asserts that his own mother died of hydrophobia a few days after being bitten by an angry epileptic, the true interpretation may be, not only that the character of the secretion was altered, but that those who were bitten were in a peculiar condition of health at the time.

In view, also, of recent researches it appears possible that some of these cases may be due to the poisonous effects of a ptomaine already in the saliva.

Gaubius records several cases. A soldier quarrelled with a woman, who thereupon bit his hand. He was seized with rigors and died. An enraged Italian youth, unable to revenge himself, bit his own hand and was seized with a deadly fear of water, as if bitten by a rabid dog.

Gaubius confessed himself unable to explain how "such pestilent corruptions of the fluids are so suddenly excited." In reference to this observation, Prochaska admits that it is quite possible that the nerves, irritated by anger, may by virtue of their influence over the secretions render

them impure, although we cannot determine in what this impurity consists (i, p. 421). While Anger increases and poisons this secretion, Fear checks or suspends it, as is indicated by the parched mouth, which is readily explained physiologically by the inhibition of the nerve-endings of chorda tympani in the salivary glands.

Speaking of the salts of the saliva, Mr Wilkinson (xlix) forcibly says, "they become as different at different times and in different persons, as the billing of the dove from the bite of the rattlesnake, or the sweetest milk from deadliest poison. There is saliva full of care and sourness, which eats, not the food, but the stomach itself. There is saliva charged with contempt, which is spit upon meanness, and carries the badge from soul to soul where it lights. There is the saliva of disgust, which is vomited from the loathing blood, and avenges our disgust upon the ground. There is the spittle of self complacency, elicited by the happy tongue, and too good not to be swallowed. There is the saliva of rage, which foams violently forth upon the beard, and that of haste and hurry which froths and sputters. There is the saliva of grief, hard to get down, and full of choking. There is the mouth of fear, from which the saliva is frightened, and the dry tongue cleaves to the palate."

Gastric Juice.—Pleasurable emotions increase the amount of gastric juice secreted, the opposite effects being produced by depressing passions. Dr Beaumont found in the man with the fistulous opening into the stomach "that anger or other severe mental emotions would sometimes cause its inner or mucous coat to become morbidly red, dry, and irritable; occasioning at the same time a temporary fit

of indigestion" (xliii, p. 22). In dyspepsia, which constitutes so forcible an illustration of the influence of abnormal mental conditions, a change in the character or amount of this secretion, may or may not be the principal cause, but that morbid feelings acting directly on the stomach through the pneumogastric and sympathetic nerves, do form one important element in the psychical genesis of the dismal symptoms comprised under this term, cannot admit of doubt.

Claude Bernard, in his lectures in 1860, showed that taking the two nerves of which the solar plexus is composed—the vagi and the sympathetic—as those which influence the digestive process, galvanism of the vagi excited secretion of the gastric juice, while the same stimulus applied to the sympathetic arrested it. "We therefore meet with two orders of nerves in the stomach as in the case of all other glands: motor nerves which accelerate the secreting process, and organic nerves which oppose it. In accordance with the above, Dr Rutherford, Professor of Physiology in the Edinburgh University, found that division of the vagi during digestion caused blanching of the mucous membrane of the stomach (xxxii, May 20, 1870). We have every reason to suppose that the emotions act powerfully upon the digestive process through the nerves composing the solar plexus; the depressing emotions contracting, and the exciting emotions dilating the capillaries of the stomach. Whether a depressing or painful emotion, Fear, for example, contracts the vessels by stimulating the sympathetic nerves or by paralysing the vagi, may be doubtful, but the probability would seem to be that it suspends the action of the latter

and allows the former full sway. (See Summary at the close of this chapter, and also the remarks on the action of the vagus on the heart in connection with the emotions).

Fletcher in his "Sketches" mentions a barrister who enjoyed perfect health except when anxious during the assizes. Then the tongue became brown, the appetite vanished, and if food was taken, severe pain in the stomach succeeded. His anxiety once removed, his tongue cleans, and "his appetite, a distinguished one, returns with such uncontrollable force, that this limb of the Law stops at a half-way house in his return home, when the limb of an animal less dangerous than himself satisfies, in some measure, the capricious humour of his otherwise most respectable and certainly very capacious stomach" (lxxiv, p. 19).

Brierre de Boismont records the case of a convict who was greatly surprised and distressed with the verdict he received. Gastric and hepatic symptoms followed, and it was thought he would die. He was removed from the prison. He scarcely took any nourishment, and suffered from continual nausea, and frequent vomiting, the matter thrown up being chiefly mucus. Organic lesion of the stomach and hepatic tumour were diagnosed. In a week, however, he improved; he was able to take a few spoonfuls of soup, and he eventually recovered. He said (and his doctor agreed with him)—"Si j'étais resté huit jours de plus dans la prison, j'étais un homme mort" (xxxv, 1853).

Bichat maintains that cancer of the stomach frequently owes its origin to powerful emotions—"l'impression vive

ressentie au pylore dans les fortes émotions, l'empreinte ineffaçable qu'il en conserve quelquefois" (li, p. 40).

Liver.—Popular opinion connects bile and bad temper or melancholy together, perhaps more thoroughly than any other psychical and physical facts, the supposed order of events being sometimes psycho-physical, and at others physico-psychical. This latter is implied when we say that a man displays a great deal of bile, and from the same cause originates the word choleric. Homer speaks of the $\chi\omicron\lambda\omicron\varsigma$ of Achilles in the 'Iliad' (ii, 241).

"Achilles bears no *gall* within his breast."

And it may be noted, as marking the interchangeableness of bodily and mental terms, that it is as fitting to speak of "the gall of bitterness" as the bitterness of gall.

The Latin poets abound with references to the connection between the liver and the emotions, as in Juvenal:—

"Quid referam quantâ siccum jecur ardeat irâ?"

But such passages bear more especially upon the supposed seat of Anger in this organ—an idea mainly springing, however, from the influence of the mental states upon the viscera. It was not Anger alone which was supposed to be connected with the liver. The "jecur ulcerosum" of Horace was induced by Love. Plautus terms this feeling "morbus hepaticus;" Solomon speaks of the misguided youth in whom "the dart" of passion "strikes through his liver." It is to Grief that Jeremiah alludes when he complains, "my liver is poured upon the earth."

Gaubius, in asserting that the natural properties of the

juices may be so altered that, with astonishing rapidity, the bland becomes acrid, and the salubrious hurtful—nay, virulent—asks, “Do you doubt it? I give you the example of an hysterical woman who, in a passion, vomits vitiated bile of every colour and acidity.” Dr Carpenter remarks that it is “perhaps not an ill-founded opinion that melancholy and jealousy have a tendency to increase the quantity, and to vitiate the quality of the biliary fluid,” and that “it is certain the indulgence of these feelings produces a decidedly morbid effect by disordering the digestive processes, and thus reacts upon the nervous system by impairing its healthy nutrition” (viii, p. 982). The influence of sudden fright in checking the secretion of bile, and so occasioning jaundice, is adduced by Bichat as a striking proof of the connection between mental states and the secreting organs. Emotional jaundice, like emotional cholera, may, as already stated (ii, p. 59), be also caused by abnormal action of the muscular coat of the gall-duct and the intestines, and it would be hard to decide, in a given case, to which division to refer the symptoms. Dr Budd, in his “Diseases of the Liver,” observes that jaundice, following mental shock, long continued anxiety, or grief, is often unattended by any alarming symptom, “but, now and then, after it has excited for some time without any symptoms indicative of especial danger, disorder of the brain, which proves rapidly fatal, comes on. After death in such cases portions of the liver are sometimes found completely disorganised. *It would seem that some virulent poison is generated in the liver, which deranges and then paralyses the brain, and after death comes softening and disorganisation of the liver*

itself" (p. 478). Dr Wilson Philip asserts that depression of mind, if protracted, alters the structure of the liver. Dr Badeley records the case of a certain great military officer who left England at an advanced age, to take possession of his office, without his lady, and without even bidding her farewell. As soon as she heard of his departure, she almost immediately became yellow, took to her bed, refused all food and medicine, and died in a very few weeks (xc). Dr Anthony Todd Thompson states that "a young man in Paris had a musket pointed at his breast; he became suddenly deeply jaundiced, for which he was taken to a hospital and died."

Dr Murchison in his Croonian Lectures on the 'Functional Derangements of the Liver,' observes that "there is good evidence that nervous agencies may not only cause functional derangement, but cure structural disease of the liver. Acute atrophy in which the secreting cells are rapidly disintegrated and the functions of the organ arrested, appears in many instances to have a purely nervous origin; very often the first symptoms of the disease have occurred immediately after a severe fright, or an outburst of passion in a person previously healthy.

. . . Many observations have satisfied me that the extrusion of gall-stones from the gall-bladder as well as their formation, may be traced to nervous agency. . . . I have repeatedly known attacks of biliary colic from gall-stones excited by some sudden emotion. Lastly, even cancer of the liver appears sometimes to result from the functional derangement induced in the first instance by mental trouble. I have been surprised at the frequency with which patients suffering from primary cancer of the

liver have traced the commencement of their ill-health to indigestion, following protracted grief or anxiety. The cases have been far too numerous to be accounted for on the supposition that the mental distress and the cancer have been mere coincidences. A similar observation has, I believe, been made by Sir Robert Christison and by other eminent authorities" (xlvii, May 2nd, 1874).

Passing from the liver we may here refer to the *spleen*, which in our language is so frequently employed metaphorically. A fretful person is splenetic, spleenful, or spleeny (Shakespeare); a mild and gentle person, spleenless. In a curious old book, the 'Breviary of Health,' published in 1552 by Andrew Borde, the writer, after observing that "melancholy meats, hard chese, and feare is not good for the spleen," adds, "in English it is named the passion of the splene. The cause of this impediment: This impediment doth come by thought, anger, or care, or sorrowe, of imprysonment, of feare and dreade, and for lack of meat and drynke. And it may come of great solytudnes, or solytudnesse to study, or to be occupied about many matters. *A remedy*: The chiefest remedy for this matter is to use honest and mery company, and to be iocunde and nat to muse upon no matter, but to leaue of al pleasure and nat to study upon any supernaturall thynges, specially those thynges that reason can not comprehend, nor use not to lean or stoupe downe to write or ride, and beware of slepe the afternone and use the medicines the which he expressed in the chapitre named Splen" (Antiquarian Notes, in the 'Athenæum,' Sept. 16th, 1871).

I regret that I have no more positive evidence of the

influence of the emotions on this viscus, though it seems highly probable that it is very considerable in such an organ as the spleen.

Intestinal Secretions.—Apart from muscular action, defecation may become urgent, or occur involuntarily from various causes, one being the increased secretion from the intestinal canal, as from Fear, and in some cases from the altered character of the secretion itself. While in this respect the influence of Fear may be inconvenient in man, it naturally assists escape in some animals, as the polecat.

Certain cases of choleraic diarrhoea (although, of course, complicated with other pathological states) may be referred to here.

The story of the Russian convicts under sentence of death, some of whom were placed in beds falsely said to have been occupied by cholera patients, will occur to the reader. Mr G. Smith reported in the 'Lancet' of Aug. 4th, 1866, the case of a fine hale blacksmith under surgical treatment in King's College Hospital, who carried down the bed on which a cholera patient had died. He sat up until late, brooding over what he had done and its probable consequences. He died next morning of cholera. Those, however, who believe that cholera is contagious would not admit that, in this case, Fear was more than the exciting cause of the attack.

When, some years ago, the cholera was prevalent at Newlyn, a fishing village near Penzance, intercourse was forbidden between the two places. One day a man entered the shop of a barber in Penzance, and was shaved. On leaving, some one, who had recognised him, asked

the barber if he knew whom he had been shaving. He replied he did not. "Why, he's a man from Newlyn!" It was enough. The terrified barber was seized with cholera, and died within twenty-four hours.

Mr —, of Falmouth, some years ago, had the cholera. When well, he went to the Lizard for change. The woman who opened the door of the house to which he went, having heard that he had had the cholera, was exceedingly alarmed, and had an attack herself.

Catamenia.—It would be tedious to enumerate even a small proportion of the cases which are on record, showing the influence of moral causes on the suppression of this secretion. Disappointed affections, every one knows, are a fruitful cause, and in such instances there can be no confusion between cause and effect. The sequence of the phenomena is also clear when Rage operates, as in a case recorded by Brierre de Boismont, of a lady who was thrown into a furious passion by some circumstance in consequence of which suppression took place. Remedies failed to relieve her, and she became insane. Regarded as possessed she was exorcised, but without effect. Subsequently, medical treatment restored the uterine functions, and, concurrently, her mental health (xxxv, 1851, p. 593).

Milk.—The influence of emotional excitement on the secretion of the mammary gland is generally recognised, and there is no difficulty in meeting with cases which forcibly illustrate it. A few striking examples must suffice.

Descuret states that during a period of four years, a young woman suddenly lost her two children and a foster-child from giving them the breast immediately

after being in a violent passion (lxvi, p. 56). He also cites from Parmentier and Deyeux, that after powerful emotional excitement, the mammary gland secretes an insipid yellowish serous fluid, instead of one possessing its normal white saccharine character. Copland cites from Gräefe the very striking case of a woman who received a fright a week after delivery. This caused complete suppression of the milk, followed by ascites and anasarca. Paracentesis was performed; "a bucket of fluid resembling whey, and exhaling an acidulous odour, was drawn off. Upon being boiled with dilute sulphuric acid, it furnished a substance resembling casein. When tapped six weeks afterwards, the fluid was of a greenish-yellow, and without the least trace of casein" (lxx, i, p. 189).

Dr Kellogg, of Port Hope, Canada West, gives the following cases :

"Not long since, I was called to see a child aged seven or eight months, which up to a short time before my being sent for, had been in a most thriving condition, exceedingly healthy and robust. I found the child in a state approaching complete coma, in a condition much resembling that which results from hydrocephalus, or anæmia of the brain, as the result of some exhausting disease. It had suffered none such, however; and as the coma had come on suddenly, constipation of the bowels only having been observed as its forerunner, I felt puzzled to determine the true cause. After, however, a free action of the bowels, for which large doses of cathartic medicine were required, it rapidly regained its consciousness, and after passing dark green stools for a number of

days, completely recovered. The mystery which shrouded this case, and which I was not able to unravel at first, was soon, however, explained, for in conversation with a near neighbour I learned that the mother, who was a woman of very violent temper, had for a number of days been giving way to most intense paroxysms of rage, which had been expended upon her husband for selling a piece of property against her wishes. During all this time she was nursing her child. I immediately requested the mother, if she wished to rear her offspring, of which she was passionately fond, to suspend nursing it under such a state of mental excitement; and if she could not control herself, and make up her mind to be quiet and cheerful, it would be advisable to wean the child, or employ a wet nurse, while giving the reins to her passion, and not allow its force to be expended upon the frail being who was innocently drawing its nourishment from her bosom. She appeared to feel the justice of the reproof and was, doubtless, more careful for the future, as the child did well, though not weaned for several months after this occurrence (lxxviii, April, 1856, p. 313).

Dr Kellogg observes, "I am confident that I have frequently seen the death of the nursing infant result from ignorance of the mother of the extraordinary influence of mental emotion upon the secretion of milk."

Tears.—The secretion of the lachrymal gland is, we know, excited by joy (and tender emotions) as well as by grief, its natural excitant.

"Back, foolish tears, back to your native springs—
Your tributary drops belong to woe,
Which you, mistaking, offer up to joy."

ROMEO AND JULIET, iii, 2.

We must confess with Brodie that we are unable to answer so simple a question as, why or how does a certain state of mind augment the secretion of this gland? Gratiolet inferred, partly from his own sensations, that tears result from reflex irradiations which traverse the fifth pair of nerves; that is to say, the emotion of Joy or Sorrow acts first upon the heart or other viscera through motor channels, and is then reflected upon the sensory nerve supplying the gland. But this track does not seem anatomically or physiologically probable. Much more likely is it that the influence is transmitted directly either to the capillaries of the gland by actively dilating motor nerves, or through nerves to the lachrymal cells themselves, directly exciting their functional activity.

The *quality* of the secretion seems to be altered by powerful emotions, the saline ingredients being increased, causing "a strong brine."

Lastly, the secretion may be checked. The intensity of the feeling or the suddenness of the sorrow is the most frequently witnessed cause. Daily observation shows that the first result of distressing intelligence is the negative one—inability to cry. See, too, what the want of a handkerchief may do. "I went," says Hunter, "to see Mrs Siddons acting; I had a full conviction that I should be very much affected, but unfortunately I had not put a handkerchief in my pocket, and the distress I was in for the want of that requisite when one is crying, and a kind of fear I should cry, stopped up every tear, and I was even ashamed I did not, nor could not, cry" (Posthumous Papers, vol. i, p. 557).

Exhalation and Absorption.—As all dropsies may be referred to increased transudation or diminished absorption, we would briefly refer under this head to two cases illustrative of the influence of emotional excitement in checking and exciting these functions. The influence of the sympathetic nerves upon absorption has been demonstrated by Bernard; their division accelerating, and galvanism suspending the process.

Dr Py, physician to the hospital at Narbonne, reported in the 'Gazette de Santé' the case of a boy, *æt.* 11, in whom ascites occurred under the following circumstances:—Pierre Peyrel, having lost his father, imagined in a dream that he returned and embraced him, which gave him a great fright. He was a pupil at the "Hotel de la Charité," and the officers of the establishment were surprised next morning to find the abdomen distended (*enflé du ventre comme un ballon*), as the lad had played and taken his food as usual the preceding day. He was found by the doctor to be feverish, the pulse small and hard, and the abdomen painful and tender. Medicines having failed to remove the effusion, the surgeon to the hospital drew off ten pints (Paris measure) of clear fluid, the cure being completed by local frictions and diuretics.

In the following case (which was regarded as one of ascites), for the genuineness of which I can vouch, the pathology is doubtful, and therefore it is rather recorded here on account of its importance than as necessarily a proof of direct absorption. The fluid rapidly disappeared as the action of the kidneys increased:—

A woman, aged about 45, was attended by Dr B—, in a small town in Devonshire. He found medicines

perfectly useless, and was, therefore, determined to try his hand (his first essay) at paracentesis. He intimated to the patient what he intended to do on the following morning, which alarmed her much; in fact, nearly frightened her out of her wits. He invited two of his medical friends to assist him in the operation. The trio were duly ushered into the sick room—but no operation! The fluid had vanished, discharged chiefly by the bladder. They found the poor creature exhausted, blanched and as thin as a lath. The abdomen was bandaged, and the worthy doctors walked back to the surgery to consult, and unriddle the mystery.

A passing reference may here be made to the influence on pulmonary exhalation of emotional states, the breath being rendered notably offensive by distress of mind, and to the acid eructations and flatulence, exhaled from the digestive mucous surfaces, which arise from the same cause. In regard to heartburn, an expression which receives an illustration from Shakespeare, indicates the popular belief. "How tartly that gentleman looks! I never can see him but I am heart-burned an hour after." Though mental heartburn only be implied, the metaphor is itself a recognition of the relationship between the two states—bodily and mental.

Before concluding the consideration of the influence of the emotions upon the organic functions, I wish to refer to several disorders of the system which are important illustrations of this influence, and which may perhaps, be enumerated here more appropriately than in any other place; they should be studied in connection with the action of the vaso-motor nerves.

Fever.—According to Cl. Bernard, the early stage of fever marked by rigors is analogous to that which is artificially produced by reflex action upon the sympathetic, and consequent constriction of the vessels, by galvanizing the central termination of a cerebro-spinal nerve, this being followed by elevation of temperature in consequence of the vascular dilatation which succeeds the vaso-motor excitement. The latter febrile state answers also to that caused by section of the sympathetic. “If,” says Bernard, “we only suppose the generalisation of the phenomena which we have observed as the result of the division of the ascending branch of the great sympathetic, we should have a true fever—increase of heat, a sense of oppression, rapid pulse, perspiration, brilliancy of the eyes, &c.” “We have seen besides that on the side on which the sympathetic has been divided, the blood preserves its bright red colour while traversing the capillaries; the phenomena of nutrition do not take place. The same thing occurs in certain pathological states. Thus, since I made known my experiments, cases of malignant fever have been published in which the blood passed on into the veins, having the appearance of arterial blood, venous pulsation being also observed. In these conditions the sympathetic system is in a state similar to that in which section has been performed, a remarkable elevation of the temperature of the surface of the body being also present. But in these conditions there is also an equilibrium between the external phenomena of heat and the internal temperature. The hepatic and intestinal functions, the principal sources of animal heat, are no longer performed. The production of heat ceases in

logical laws. The perception and recognition of these laws by the physician is important in the invasion of disease, especially of epidemics.

In the reports of cases of Continued Fever given by M. Andral, in his 'Clinique Médicale,' occurs that of a young man, *æ*t. 22, whose disorder did not originate in Emotion, but whose death appeared to be hastened by Fear. The patient had been told that the plague reigned in the Paris hospitals. He was very much alarmed by this news (which was false), and he regarded himself doomed to inevitable death. The pulse became frequent after having improved, stupor appeared, and he died three days afterwards. Andral, commenting on this case, says, "When convalescent from a dothinentérite, a moral excitement acted on him; he all at once presented symptoms which indicated considerable disturbance of innervation. He died in a few days, and anatomy discovered neither in the nervous centres nor elsewhere any lesion whatever to account for the alarming phenomena which hurried him to the grave" (p. 782).

Intermittent Fever.—Nebelius was lecturing one day upon Medicine, the subject being a description of ague; when one of his pupils (doubtless highly susceptible and nervous) became pale, began to shiver, and at last had all the symptoms of intermittent fever. He was laid up, had three or four paroxysms of tertian fever, and was cured by the usual anti-periodic remedies (lx, p. 295).

This is an admirable illustration of a fearful imagination producing the thing feared. And when we extend the examination of psychical disease-producing causes to those which induce disorders not connected with any disease in

the person's mind, we find examples of ague induced by sudden fright which are strikingly illustrative of the morbid effects of this emotion. In the 'Annales Médico-psychologiques' (1851, p. 660) is reported a case of "Tertian Fever caused and cured by a vivid moral emotion" which falls under this category. A young lady, Mademoiselle Elisabeth, was engaged in needlework at the window when she saw a neighbour precipitate himself from the upper story of his house. She was instantly seized with nervous tremors which nothing served to lessen, and by their persistence for some days occasioned her family great alarm. At last, under the treatment adopted—prolonged baths, anti-spasmodics, &c.—she became calm and was considered cured, when, on the approach of the catamenia, an attack of tertian fever supervened, "*parfaitement caractérisée.*" The attacks returned at the same periods in spite of appropriate treatment ("*le plus varié et le mieux indiqué*"). Her physician, Dr Bouygnés, failed to modify the course of the disorder except in the intermediate time of uterine repose. We may add that she was cured by a purely psychical agent, the sudden return home of a brother, the captain of a vessel, who had been exposed to great danger in a voyage. Her emotion was so intense that she remained motionless, her eyes fixed upon him, and unable to speak a word. She afterwards said that at that moment she underwent an extraordinary change. The attacks of ague never returned.

The Duke of Norfolk, when suspected by Queen Elizabeth of conspiracy, and anxious to clear himself in her presence, found his heart fail him, and "fell into an

impossibility ; for which reason (as seems to me) gout rarely attacks fools. Those who choose may except the present writer." (Works, Syd. Soc., vol. ii, p. 148).

Death.—We have already in the Chapter on the influence of the emotions on the Involuntary Muscles recorded cases of death from indisputable action on the heart or brain. In this place several more may be given without, however, any proof being afforded of the immediate cause of death, with the exception of the following very striking case which has occurred quite recently, and is reported in the 'Lancet' (Sept. 1st, 1883), by Dr J. E. Cooney, of London.

"G. E. H—, aged seven years, the son of a sweep, had been witnessing a fight between two gipsy lads, when, as the contest became exciting, he suddenly fell backwards and was dead in a few moments. I was called in by the police immediately after death, and found the body, which was still warm, lying on its dorsal aspect on a soft patch of grass. The features had a placid expression, and his soot-smearred face exhibited the traces of recent tears. It was stated that there was no one nearer to the boy when he fell than the two belligerents, who were about ten yards' distance.

"The history which I elicited was as follows :—The father had been a soldier in India and elsewhere for twenty-one years prior to taking up his present occupation, which he had followed for the last three months only. The mother had died suddenly a year ago, and was the subject of a coroner's inquest ; but the cause of her death I have, in vain, tried to discover. The deceased was an only son. His sister, aged four years,

seems delicate, and I learn that his half-brother and sister are robust and healthy, and have no neurotic tendency. He was of a remarkably affectionate disposition, and was easily excited by the slightest unusual occurrences. The boy had had his dinner a quarter of an hour previous to death, and had kissed his father before leaving home as usual.

“ Agreeably to the coroner’s order, I made an autopsy forty-eight hours after death. The body was plump, and the external aspect on examination showed no marks of injuries or contusions. Head : The dura mater was not adherent to the brain, neither was there any sign of fractures or effusions of fluid. The brain weighed 42 oz., was well formed, firm, and with convolutions and sulci well marked. The puncta vasculosa were a little more than ordinarily prominent. The several ganglia and ventricles of the brain were normal ; minute examination betrayed no rupture of bloodvessels or extravasations. The examination of spine showed no dislocation or other injury in the region of the atlas and dentata or elsewhere. The medulla oblongata and cord were apparently healthy. Chest : The right cavity showed a few old pleuritic adhesions ; left pleura and cavity healthy. The lungs were normal, though a little gorged with blood ; the pulmonary veins contained some fluid blood ; the pericardium was healthy, and its secretion was of the normal colour, quality, and quantity ; the right auricle was much distended, almost to bursting, with dark grumous fluid blood ; the right ventricle was about one-third full of the same ; the superior and inferior cava and hepatic veins were also much distended with dark fluid blood ; the left

auricle was full but not so distended as the right; the left ventricle also contained a little fluid blood. The pulmonary veins were filled with fluid blood, and the two left veins terminated by a common opening in the left auricle. The heart's septum was normal, and its valves competent and there was no evidence of rupture or disease. The liver was normal and healthy, the hepatic veins being filled. The kidneys were normal. The urinary bladder was half filled, and was perfectly healthy. There was no sign of injury to the abdominal walls. The diaphragm, peritoneum, spleen, pancreas, and supra-renal bodies were perfectly healthy and in their normal positions."

At the inquest Dr Cooney expressed his belief that the boy's death was due to strong emotion. His explanation was in accordance with the most probable view as to the way in which a fatal result is brought about in such cases, namely, that the heart's action is inhibited through the action of the vagus under excessive emotion, the cardiac ganglia of the sympathetic being completely antagonised.

The ill effects of Joy, when excessive, so contrary to its beneficial influence in moderation, has often been a subject of philosophical remark. I have seen it stated, within a few years, that several convicts, Irishmen, undergoing imprisonment for life, fell down dead on being informed that they were liberated.

The following are well-known instances:—

Valerius Maximus states that two Roman matrons died with Joy on seeing their sons return in safety from the battle fought near Lake Thrasymenus. "One died while embracing her son; the other was suddenly sur

prised by the sight of her son while she was deeply lamenting his supposed death."

I may add that quite recently similar fates, the result of a rebound from Grief to Joy, have awaited several women in connection with shipwrecks, their husbands having been reported as certainly lost and then turning up.

That this influence would resolve itself into one of sorrow in some instances may be suggested by the cynic, but we decline for the honour of human nature to accept this explanation.

History also records that "Sophocles, at an advanced age, and in the full possession of his intellectual power, composed a tragedy which was crowned with such success that he died through Joy; that Chilon, of Lacedemon, died from Joy while embracing his son, who had borne away the prize at the Olympic games. Juventius Thalma to whom a triumph was decreed for subjugating Corsica, fell down dead at the foot of the altar at which he was offering up his thanksgiving. Fouquet, upon receiving the intelligence of Louis XIV having restored him to liberty, fell down dead" (lxxvi, p. 96). To these examples may be added those of Diagorus, an athlete of Rhodes, who died from seeing his three sons return crowned from the Olympic games; and Dionysius, the second tyrant of that name, who died on hearing the award of a poetical prize to his own tragedy (xlili, p. 18).

SUMMARY.—1. The emotions powerfully excite, modify, or altogether suspend the organic functions.

2. This influence is, in all probability, transmitted not only through vaso-motor nerves, but through other nerves also, namely, those in close relation to Nutrition and Secre-

tion (*e.g.* chorda tympani, &c). As, when the excitement is of peripheral origin, a sensory or afferent nerve excites their function by reflex action, so when Emotion arises it may excite the central nuclei of such afferent nerve, and this stimulus be reflected upon the efferent nerve; or it may act directly through the latter.

3. In regard to the processes of Nutrition, the pleasurable emotions tend to excite them. Hence the excitement of certain feelings may, if definitely directed, restore healthy action to an affected part.

4. Violent emotions may modify Nutrition. Various forms of disease originating in perverted, defective, or inflammatory nutrition are caused primarily by emotional disturbance.

5. As respects Secretion, the emotions, by causing a larger amount of blood to be transmitted to a gland, increase sensibility and warmth, and so stimulate its function, or they may directly excite the process by their influence on nerves supplying the glands.

6. Painful emotions may modify the quality (*i. e.* the relative proportion of the constituents) of the secretions.

7. The emotions may check Secretion, either by extreme acceleration of blood through a gland, by unduly lessening its afflux, or by direct influence upon the gland. Although, as a rule, the activity of those glands which bear special relation to an emotion, is in a direct ratio to its force, the secretion is checked when the emotion is excessive.

8. The pleasurable emotions tend to act only in one direction, that of increased activity of the secretions, but the painful emotions act both in stimulating and arresting

Secretion. Thus, Grief excites the lachrymal, and Rage the salivary glands. Excess of Grief checks the lachrymal, and Fear the salivary glands, while Anxiety suspends the gastric. *Extreme* Fear induces perspiration.

9. Lastly, although it may be doubted whether we are yet able to construct a consistent theory of the action of the emotions upon Secretion, we may endeavour to apply what we do know to occur on the external surface of the body to the internal organs, supplemented by the conclusions arrived at by Bernard. Fear, then, causes pallor of the cheek (apart from its action on the heart). Either the contractors of the minute vessels have been stimulated, or the active dilators have been paralysed. Assuming that the capillaries of the glands are similarly affected by Fear, we should infer that there would, with this emotion, be less vascularity and secretion. Consistently with this, we find the secretion of milk lessened by Fear or Fright. The temperature of the skin is lowered, and its secretion checked, although cold sweats as already explained, may occur. Salivary secretion is arrested. Intestinal secretion is often increased, it is true, but probably this may be explained, so as not to form a real exception to the general rule, that Fear has the effect on secretion which we should have expected from facial pallor. In the opposite condition of the cheek, from shame or guilt, it is difficult to say whether the activity of the glands tends to increase or decrease, but probably the former, and, if so, the parallel holds good. If, further, we regard the influence of Joy when, taking the place of Fear, it restores vascularity to the cheek, we see that the general action of joyful emotions is to augment the activity of the glands.

The special action of Grief in exciting the lachrymal secretion cannot fairly be regarded as an exception ; and Joy, even in this instance, may exercise its normal influence. In this condition of the cheek and glands we assume that either the vaso-motor contractors have been paralysed, or the active dilators have been stimulated—probably the latter. We have here confined ourselves to the action of the vessels, but by no means exclude the action of nerves which may act directly upon the glands. With regard to these, we cannot, however, ascend from the known and visible to the unknown and invisible. As to the relative share taken by the sympathetic and cerebro-spinal systems, we must be in doubt until physiologists determine the character of the dilator nerves.

CHAPTER XII

DO MENTAL STATES, ESPECIALLY THE EMOTIONS, ACT
INDIFFERENTLY UPON THE SEVERAL ORGANS AND
TISSUES OF THE BODY?

To a considerable extent we have already answered this question in the negative, but we wish to refer more definitely, although briefly, to this important aspect of the inquiry.

While popular sentiment, ancient and modern, recognises tolerably definite relations between the several emotions and the bodily organs, there has been a marked diversity of sentiment among physiologists, except in reference to such glands—the lachrymal, the mammary, and the spermatic—as are obviously related to special Emotional States.

Lactantius, referring to the very widespread notion among the ancients that Anger or Desire is placed in the gall, Fear in the heart, and Joy in the spleen, despondingly observes that “the acuteness of human sense is unable to perceive these things, because their offices lie concealed; but we cannot, however, prove that they who discuss these things, speak falsely.” “I know,” says Müller, “no single proof, but only tradition, that in the healthy man, a passion acts more upon one organ than

upon another. No special passion acts regularly upon the stomach or the heart ; in a sound person their effects extend *radiatim* from the brain over the spinal cord, and over the animal and organic nervous system." And Dr A. Zeller observes, "In the affections it is shown that the entire body is a psychical organism, and only a false tradition makes the special passions act exclusively upon special organs. Only in the affections, which require a distinct member for the realisation of an urgent idea or craving, does a special current towards that organ occur."

In direct opposition to these opinions, we find Domrich stating that "the assertion that the several movements of feeling do not affect the special organs of the body in a different manner, both quantitative and qualitative, is one-sided and in contradiction to the experience of life ; it is not true that Sorrow and Joy stir the heart in the same manner ; it is an error to say that every passion may rise into weeping ; it is false to say that only in the case of those who already have diseased liver, or an innate and excessive tendency to disease of the liver, does Anger disturb that organ. Who by unprejudiced examination would ever come to the conclusion that the bodily phenomena of amazement and of cheerfulness, of persistent heart-breaking sorrow, and of unrestrained joyousness, are the same ? The more the affections are considered without prejudice, and the more closely they are psychically analysed, the more firm is the conviction that as well the kind of excitement as the most special nervous lines in which that stimulus proceeds are peculiar to single emotions." In the same direction Damerow expresses himself :—"An entirely distinct consideration is required in

connection with the bodily effects of the emotions and passions, for the altogether individual, special, constant, or varying influence upon this or that organ.”*

We have referred to the opinion of the ancients that Fear has its seat in the heart, doubtless from the palpitations caused by this emotion. Others spoke of courage and warmth of feeling as functions of the heart, just as popular language speaks of “being of good heart,” and recognises as “a hearty fellow” one whose feelings are fervid. “Homines splene rident, felle irascuntur, jecore amant, pulmone loquunt, corde sapiunt.” And similarly, with a difference :—

“Cor ardet, Pulmo loquitur, Fel commovet iras,
Splene ridere facit, cogit amare Jecur.”

“The Heart doth burn, the Lungs do speak,
The Gall to ire doth move,
The Spleen or Milt doth make us laugh,
The Liver makes us love.”

(MIZALDUS.)†

It is singular to find an idea associated with the spleen so entirely opposite to that usually current. Indeed, the idea of there being any relation at all between this organ and some disposition of mind is very singular, considering the obscurity in which its functions have been veiled.

Let us now, passing from these conflicting sentiments, state succinctly what we really know in regard to the particular direction of the Emotions :—

* For the foregoing opinions of Müller, Zeller, Domrich, and Damerow, I am indebted to Delitzsch.

† I owe these lines to an anonymous book published in 1659, ‘A Thousand Notable Things.’

1. It is admitted, in the first place, that, as respects some glands, one Emotion will specially influence them ; that, for example, there exists a specific relation between Grief and the lachrymal glands, as also between maternal tenderness and the mammary glands. Rage appears to act more directly upon the salivary secretion than upon any other.

2. Again, it is equally certain that the Emotions do not act *exclusively* upon any one organ. This is true even of those which are admitted to be directly related to special glands ; and of the rest, not only do they not act exclusively on a single organ, but the organ most affected is mainly determined by conditions which are independent of the distinctive character of the Emotion.

3. As any Emotion may act upon any organ, it is not surprising that the same Emotion may induce different diseases, and *vice versâ* ; but this is not in the least inconsistent with the position that, under the same circumstances, the same Emotion may aid in producing the same disease. Of these conditions, one is the temperament or diathesis of the subject of emotional excitement, another is the presence of actual disease in an organ.

4. Different persons may be differently affected by the same Emotion—a corollary from the preceding remark respecting temperament.

5. As regards the action of the muscles in Expression, it has been shown that certain emotions affect the same muscles in all. Laura Bridgman did not require to be taught how to mould her features in Joy, Anger, &c., the particular character of the muscular contraction in Emotional expression being stereotyped by heredity.

6. Bain makes the forcible observation, that acute Emotions, as Wonder, stimulate the movements; massive Emotions, as the Tender Feeling, are more connected with the action of glands (lxxix, p. 8), a remark which may be applied to disorders of the motor and secretory systems.

7. Certain Emotions, as Fear, affect the action of the heart in all, both in health and disease.

8. Shame specially affects the skin, more particularly the cheeks. It is a common remark that while the blush of Shame commences at the cheeks and ears, that of Anger first flushes the eyes, that of Love the forehead.

9. It is generally held that the abdominal viscera are affected most by the painful or depressing Emotions, and the thoracic viscera by those of a pleasurable or stimulating character. There is a measure of truth in this, but it is certainly far from being a universal rule. Grief affects the heart very injuriously; and what is the sigh of Melancholy but a sign of the influence of Sorrow upon the respiration? So of the breathlessness of painful suspense. Joy, on the other hand, produces an effect upon the liver and stomach. Still, this opinion derives much support from the fact that the most striking effects of Joy on the body are undoubtedly those referable to the heart and lungs, while Sorrow has a very certain influence in disordering the digestion. It is justly expected that a man should be "off his meat" from receiving mournful intelligence, while no one supposes that it will cause bronchitis. It may, indeed, induce an attack of asthma, but for once that it is followed by this affection it will induce loss of appetite hundreds of times.

10. In reference to ancient and popular notions about the connection between Anger and the liver—"felle irascuntur"—it may be observed that while they were chiefly, if not wholly, founded on the supposed influence of bodily disorder upon the state of the mind, the existence of such a relation, if established, would imply the converse action, the influence of the mind upon the bodily organs, and would assist us in endeavouring to trace such special relationships. Thus, the opinion that a disordered liver, more than a diseased lung, renders its possessor irascible, might fairly lead us to suppose that Anger more immediately acts upon the liver than the lungs.

11. On the same principle as affections of the heart frequently induce anxiety of mind, we think that Anxiety would be more likely, *cæteris paribus*, to cause cardiac than hepatic disease.

12. Again, in regard to the lungs, a sanguine condition of mind is proverbially associated with phthisis, and conversely it may be said that Hope and Joy exert a marked influence over the respiration. However, these emotions, as we have seen, affect other organs in a striking manner also; so that it is only within a very limited range that we can successfully carry out the parallel, or, rather, reverse the physico-psychical phenomena. The intimate connection between the viscera themselves also interferes with the isolated action of emotional excitement.

To sum up: broadly speaking, the Intellect is primarily dependent upon Sensation for its perceptive and intellectual functions, is in the closest relation with the nervous system; Emotion, so strikingly operative upon the Organic Functions, exercises a special influence upon

the glands and tissues, developed from the mucous membrane ; and Volition, having Motion for its main functional result, acts principally upon the muscular fibre. Intellect—nerve—Sensation ; Emotion—the skin, glands, and alimentary canal—Organic Functions ; Volition—muscular contraction—Motion ; these, it will be seen, in glancing through this work, do bear a broad special relation one to another, one which, if not unduly pressed may with advantage be present to the reader's mind while employed in the study of psycho-somatic phenomena. It may, however, be stated with more truthfulness that, while the Intellect confines its operations mainly to the brain, although capable of exciting motion and the organic functions, the Emotions act with by far the greatest force upon the heart and lungs, the vessels and the glands ; and the Will, powerless in regard to these tissues and organ, exerts its influence over the muscles engaged in the motions of the body.

Probably we cannot go much beyond these general principles, which, combined with the law that any emotion, that either by its character or its suddenness, depresses the activity of the controlling power of the cerebrum, allows of the irregular or excessive action of the encephalic, spinal, or sympathetic nerve-centres, will generally serve to explain the changes induced in the body by varying mental, especially emotional, states.

PART III

VOLITION

CHAPTER XIII

GENERAL PSYCHOLOGICAL AND PHYSIOLOGICAL PRINCIPLES

In the chapters on the Influence of the Intellect and the Emotions, we were led by the interest of the subject (that of illustrating by Cases, systematically arranged, the action of Mind upon Body), to enter at some length into their psychology and physiology. In regard to Volition, however, we shall speak more briefly, inasmuch as we have, under other terms, treated of what by many is regarded as belonging to the province of the Will.

Some confusion in regard to the term itself has, no doubt, arisen from not distinguishing between the wish or desire to do a certain thing (in accordance with the etymon *voluntas*), and the power to perform it. A man wills to walk, but his will is powerless to move his legs; yet the Will in the sense employed in the first clause, is in full force. It is the motor centre which is in a morbid

condition or paralysed. On the other hand, when a physician says that, in a case of hysterical paralysis, the Will is paralysed, he means that the very wish or desire to move a limb is wanting. Indeed, Reid says that, "as it is unusual in the operations of the mind to give the same name to the power, and to the act of that power, the term Will is often put to signify the act of determining, which more properly is called Volition. Volition, therefore, signifies the act of willing and determining, and Will is put indifferently to signify either the power of willing or the act." Then, again, there is more than the mere employment of "the Will" in two different senses; there is a real divergence of opinion as to whether it constitutes an independent and separate mental faculty, or is the balance of all the other faculties—that which finally results from the struggle continually going forward in the mind between the contending functions of Thought and Emotion.

Gall held that the Will resulted, not from desire alone, but from the combined operation of desire and intellect. "That man" he says, "might not be confined to desiring merely, but might will also, the concurrent action of many of the higher intellectual faculties is required; motives must be weighed, compared, and judged. The decision resulting from this operation is called the Will" (xxii, vi, p. 267).

James Mill observes, "The idea of an action of our own, as cause, strongly associated with the idea of a pleasure as its effect excites to action. It is called Will" (xix, ii, p. 328). He then points out that, with the Will as a Cause and the action as an

Effect, men have not been content, but have added an item called Force or Power, which comes between the two, as itself the proximate cause of the action. The action of a muscle, according to Mill, takes place in consequence of an appropriate idea, our power of willing not being immediate over a muscle, but consisting in the power of calling the idea into existence. The only circumstance distinguishing voluntary from involuntary actions is Desire. This analysis is accepted by Mr J. S. Mill, so far as it applied to voluntary acts produced by motives of pleasures and pain, but as insufficient to explain those bodily movements, the consequence of which is pain and not pleasure, and he refers to Bain as probably the first psychologist who has succeeded in effecting a complete and correct analysis of the Will. Bain separates from the movements brought forward by James Mill, those which are of reflex and consensual character, and those which arise from Imitation, Expectation, and Imagination. It is among the movements excited by the last class, that we sometimes observe the remarkable tendency to act even in the direction of pain, to which reference has just been made. Thus, the sight of a precipice may, from the operation of the idea aroused, lead to the painful result of precipitation. The law at work here has been referred to when considering the tendency of ideas to result in corresponding acts, as exhibited in Sympathy and Imitation (i, p. 26). The automatic action of the hemispheres is the physiological aspect of the law. Having withdrawn these three classes of cases of mis-called voluntary power, Mr Bain considers that J. Mill's position, that there is a power in

pleasure as such, and in pain as such, to stimulate muscular movements with reference to the pleasure or pain, is the nearest approach he has made to a clear statement of the law of Volition. "The element of the Will remaining unexplained is the *selection* of the proper movements in each case, as when we start up and walk in the direction of a pleasing sound" (xix, ii, pp. 385, 389). For this he refers to two laws—the spontaneous beginning of movements, and the retentive or associative process. The former implies the tendency to act, not from sensation, but "by virtue of the fund of power residing in the active organs themselves." The latter implies that after a certain number of accidental associations between such actions and particular sensations, the above law of pleasure and pain retains or continues them when once begun. "The concurrence is fortuitous; the prolongation of it is not fortuitous, but follows the law of the Will—the abiding by whatever movement is giving pleasure."

The arguments adduced by Bain in favour of his theory of spontaneous action of nerve centres are obviously incomplete, especially when the illustrations are criticised from the point of view of experimental science; and since it is well known that removal of all external stimuli leads to fewer and fewer movements or actions on the part of the subject of experiment, it is fair to assume that complete withdrawal of such afferent impressions would be followed in all probability by cerebral inaction. The theoretical poverty of the theory of spontaneity of action is obvious since there is no reason why, when a selection has to be made (the example

referred to by Bain), the spontaneous overflow of nerve force should pass down any channel in particular, and the *reductio ad absurdum* would be found in the event of its discharging equally in all directions, under which circumstance it is to be presumed that complete inaction would result.

The direct antecedent of an act of Volition is something more than the idea of the action to be performed; it may assume various forms, although all have the common object of gaining pleasure and escaping from pain.

In some able papers "On the Nature of Volition psychologically and physiologically considered," published in the 'Psychological Journal,' 1862-3, Lockhart Clarke combats Bain's views as too exclusive, and he points out that they are essentially included in Hartley's proposition that, "If any sensation A, idea B, or muscular motion C, be associated for a sufficient number of times with any other sensation D, idea E, or muscular motion F, it will at last excite D, the simple idea belonging to the sensation D, the very idea E, and the very muscular motion F," a law of association by which originally automatic acts become voluntary. "That this *accidental* association is the means by which a great number of movements necessary for the alleviation of suffering and the procuring of enjoyment are originally discovered by the infant, there can be no doubt, but that this is the *only* means—that *all* such movements, in fact, and still more, that every kind of voluntary action must, as Mr Bain contends, 'wait upon the *accidents* and improve them when they come,' so that *without these accidents* 'volun-

tary control could not find a starting-point'—appears to be entirely opposed to what may be observed and learned by every day's experience ;” and he adds that there is an infinite number of movements which “have no immediate connection with physical pleasure or pain, but are expressly intended to be subservient to the endless variety of desires that are excited by the wants, tastes, or ideas constantly arising in the course of our daily avocations and transactions in life, and which frequently require, in accordance with the end in view, such a peculiar and complex combination or co-ordination of muscles as never could have occurred accidentally, and which nothing but repeated trials could possibly accomplish.” Thus, as expressed by Clarke, the execution of by far the greater number of particular movements by volition “is not learned by a previous *accidental* association of those movements with particular *accidental* sensations,” but “by the association of certain efforts or impulses with the requisite muscular co-ordination, discovered on trial, and rendered perfect by repetition ;” in short, those instinctive impulses which in the infant excite muscular contraction *without* the intervention of any idea, are similar to the subsequent desire, wish, or inclination, aroused by external objects, which in combination *with* the idea of the action to be performed, constitutes the Will or Volition.

But in believing that instinctive impulses may in the infant determine action without the intervention of any idea, Clarke has either employed Bain's theory of spontaneity of action, or adopted the truer explanation, *viz.* the causative influence of heredity and education.

An "instinctive impulse" leading to a somewhat complex action is but the acme of a reflex cycle, the afferent and efferent channels of which are polarised permanently, as a race characteristic, by the prolonged action of heredity. The perfection of muscular co-ordination which he states is attained by constant repetition, finally brings the act down to the condition of a simple reflex action, some considerable distance below the level of an act of Volition.

Should this be the correct mode of regarding its nature, it is obvious that the Will is not a special faculty, independent of the other mental faculties, but that it is composed of an emotional or active element, and an intellectual or regulative element, the balance of which results in a volitional act. While, then, we speak of volitional states of mind, it must be remembered that ideas and emotions co-operate to constitute volition. We think, but our thoughts alone do not result in action, unless some feeling, or rather the desire to do a certain act, which is generated by the feeling, is present. While, however, it is true that volitional acts necessarily arise from complex combinations of the various emotions and intellectual faculties, it is not the less true that our feelings and trains of thought may be controlled and directed—that is to say, one motive may modify or neutralise the force of another motive.

It is not difficult to understand how one motive ("desire," J. S. Mill) may neutralise another when the two are brought into consciousness at the same time, but the subjective sensation or idea of the existence of a controlling force, which is commonly called the "Will," is not

so easily accounted for. In fact, it is only cases in which this agency is felt to be employed, that can properly be considered as examples of Volition, although many lower grades of nerve action have also been included by Bain and others. Without, however, attempting to account for the present idea of the existence of a directing force, it may not be out of place briefly to review here the mechanism of actions which are accompanied by intelligent consciousness; that is to say actions the inspiring motives of which are reasoned over, and the whole fixed in memory. Assuming that rational consciousness occurs when the occipital, as well as other portions of the cerebral cortex, is in active function, it is easy to understand (see Diagram II) how that the nerve energy aroused in a terminal end organ (Ey) passing to a sensory perceptive centre in the cortex will from there radiate (if sufficiently powerful) to the reasoning portion of the cortex (Rc), and also to that part which is most concerned with the emotions (Ec). Thus the motive is reasoned upon and one of the emotions may be aroused. Supposing muscular action to ensue it will result in consequence of the nerve energy spreading along the arcuate fibres to the parietal portion of the cortex, the motor area, from which motor impulses descending by the direct (motor) tract to the spinal cord will ultimately stimulate the muscle after passing through the anterior cornua of the spinal cord and motor nerves. Perhaps, in addition, further action may result from collateral disturbance of the corpus striatum (Cs). This would seem to be the explanation of certain acts supposed to be voluntary, and the investigation alone of the circumstances under which they are

performed show distinctly that the character of the resultant muscular action is based entirely on precedent acts, or due to hereditary inclination, that is, the tracks $a' b' c'$ are all stereotyped, polarised by previous (often frequent) similar exhibitions of nerve energy. So-called exercise of the Will in choosing between two motives, resolves itself in such cases into the fact of the resultant nerve energy following along either tracts $b' c'$ or $\beta \beta' \gamma \gamma'$, just according to whichever offers a line of least resistance, or, in other words, is most favorably polarised, a condition popularly expressed under the terms inclination, &c. It follows from this that a very large number of so-called voluntary actions are really examples of highly complicated reflex cycles, and that when the habits, education, and hereditary "instincts" of a person are known, his actions under varying circumstances may be predicated with very fair accuracy by the same theoretic method of explanation. Practically we assume in life, that the same persons will, under the same circumstances, act in the same manner.

It certainly is, however, a very difficult thing to understand how this control is exercised, easy as it may be, in accordance with the foregoing view, to explain how the decision is arrived at to exercise it, whether in regard to the mind or the body. Lockhart Clarke, after quoting Brown's observation, "Volition is not desire itself, but exertion in consequence," remarks, "Volition is the immediate result of a *desire to act*, which is *not checked* by some stronger or at least *more influential desire*, arising out of some feeling or emotion that *reacts through intelligence* for the attainment or avoidance of its object, and

what is called the *exertion* of volition or the sense of effort, is the coincidence and approval of the intellect in the felt impulse, and the consequent combination and concentration of both in the desire itself, or upon the desired end." The reader will find the arguments in favour of this view of the nature of Volition most clearly laid down in these papers by Dr. Clarke, and those in support of a distinct faculty in the works of Locke and Reid.

As is well known, the earlier Stoics held, in opposition to the prevalent view, that man's nature and propensities are forced upon him by the necessity of a universal fate. Chrysippus compared human actions in their relation to the disposition to a stone rolling down the mountain-side which derives its first momentum from without, but whose course depends on its weight and figure (cx, iii, pp. 555-6, and 'Plut. de Stoic.,' Rep. 23, 'Cic. de Fato,' 10 and 18).

We find Plato in the 'Laws' (Bk. ix) representing the Athenian Stranger as saying "In all States and by all legislators whatsoever, two kinds of actions have been distinguished—the one voluntary, the other involuntary, and they have legislated about them accordingly," upon which passage Jowett remarks, "The great question of the freedom of the Will, is approached both by Plato and Aristotle, first from the judicial, secondly from the sophistical point of view. Their want of clearness in treating the subject is to be attributed to the difficulty which they experience in disentangling the abstract from the concrete" (Jowett's Plato v, p. 182). Aristotle divided Desire into rational and sensuous, the former being

the Will (*βούλησις*). According to him, whichever we obey, we act equally with free will and are consequently deserving of praise or blame. For the principle of action he argues is internal, and it lies within man's power to follow reason or not, so that he himself is the author, as the case may be, of his own virtue or vice ; for otherwise he proceeds to say it would be idle to exhort man to virtue and alike unjust either to punish or reward him (cx, p. 258, 'De An.,' c., 9, and 'Eth. Nic.,' iii, 1, 3, 7, 8).

Whatever, then, may be the true physiology of the Will, the ancient distinction between voluntary and involuntary acts will remain practically unaffected. No one, in fact, be he ever so strong a determinist, escapes from the distinctive use of these or synonymous terms.* The alienist physician must distinguish, whatever be his theory of Volition, between acts performed involuntarily and voluntarily. Were all deeds alike involuntary and unavoidable, responsibility would cease and every prison would be converted into a lunatic asylum. Differences in will-power in different persons must be admitted. We must hold with Tyndall that "we are capable of acting within certain limits in accordance with our wishes," with Professor McKendrick that the "highest of all our mental states is what may be called the power

* Thus Mr Bain, in speaking of Belief, employs the following language:—"Whatever may be true of the internal conviction, the outward profession of belief is voluntary, and so are the actions consequent upon what we believe" (lxxix, p. 503). And again, "It is in the power of my will to open or shut my eyes, although what I am to see when I do open them is not voluntary" (p. 504).

of the Will," and lastly with Mill that "we have real power over the formation of our own character—that our Will, by influencing some of our circumstances, can modify our future habits or capacities of willing," although after all we are but too painfully conscious of the "certain limits" referred to in even the noblest and most gifted of our race.

We may now briefly refer to a few of the various opinions which have been held by physiologists as to the encephalic seat of the Will. Gall, while endeavouring to find organs for all the mental faculties, maintained, consistently with his opinion that the Will was the outcome of the combined operation of the intellect and the desires, that there could be no distinct organ for the Will. It is nowhere, and yet everywhere; in no special locality, in all localities of the brain, so far as its function is mind. And would not this be essentially the teaching of the physiology of the present day? This must not be confounded with the encephalic centre of motion, upon which the Will is impressed in muscular movements. Endless confusion has arisen here from confounding reflex with volitional acts. "The Will," says Brown-Séquard, "or at least, *the faculty under the influence of the Will*, by which the so-called voluntary movements are produced, is considered by Gerdy, Müller, Longet, and others, as having its organ in the pons Varolii and in the brain. The reasons given by these writers to prove their views are far from being satisfactory" (lviii, p. 231). Flourens held that the cerebral lobes alone are the seat of intelligence and volition (in the sense of the motor centre), a conclusion Brown-Séquard opposes on the ground that

CHAPTER XIV

INFLUENCE OF THE WILL UPON SENSATION, THE VOLUNTARY AND INVOLUNTARY MUSCLES, AND THE ORGANIC FUNCTIONS.

SECTION I.—Influence of the Will upon Sensation

THE reader will find in the chapter on the Influence of the Intellect on Sensation, various illustrations of the power of Attention strongly directed by the Will to a particular region of the body. It is not, however, so much that the individual wills that certain sensations shall arise, as that he voluntarily directs his thoughts to certain parts of the system. The term Will is here employed in a somewhat confused way to describe two different ideas. It is true, as has already been said, that when we say we act upon the muscles by Volition, the expression is not, strictly speaking, correct, and that the Will only excites the actuating ganglia from which the motor nerves proceed ; but when we act on a muscle by simple Attention, that is, only willing the direction of the attention, not the muscular contraction, we are conscious of a very different mental act. In fact, the difference in the nature of the act is clearly shown in the

different result, for the motor ganglia with which the voluntary muscles are in relation are scarcely at all affected, while the centres of sensation and the nerves supplying the involuntary muscles are notably excited. While, therefore, in an act of Attention followed by corporeal effects, the Will in one sense may be said to operate upon the body, it is much less truly so than when the Will directly acts upon the body, however true it is that even in that case the action is not direct.

Whether the above distinction in regard to the Attention be correct or not, we may call the following case an illustration of the influence of the Will, as direct as can well be imagined. Hyacinthe Zanglois, a distinguished artist of Rouen, who was on intimate terms with Talma, told M. Briere de Boismont that "this great actor had informed him that when he entered on the stage he was able, by the power of the Will, to banish from his sight the dress of his numerous and brilliant audience, and to substitute in the place of these living persons so many skeletons. When his imagination had thus filled the theatre with these singular spectators, the emotions which he experienced gave such an impulse to his acting as to produce the most startling effects" (lxxxii, p. 41). On this case M. Briere remarks, "The hallucination is thus, in some cases, under the control of the Will, and would seem to be excited instantaneously."

In vol. i, p. 53 of this work, we referred to Newton's experience in regard to seeing the spectrum of the sun, under certain circumstances, when he meditated upon it, *without* any effort of the Will. Here it may be added that

Dr Wigan mentions a family, each member of which "had the power of forming a voluntary image of any object *at will*, on shutting the eyes, and that each could draw from memory a representation of it, more or less accurate."

Dr Guy, in a note to his 'Hooper's Physician's Vademecum,' states that, "when a feeble and sickly child, I possessed the power of creating ocular spectra at will, in a very remarkable degree. I could design on the dark ground, and on a small scale, any picture, however complicated, filling in object after object with all the outlines and colours true to nature. During this period my imagination was uncommonly active in sleep, occasioning dreams of the most fearful kind. As my health improved, I lost this power of creating images at will, and since my seventh year have never regained it, though I have suffered occasionally from false impressions on the sense of hearing." With Goethe also, ocular spectra were voluntary; with Müller, involuntary.

The Will may, in some cases, influence hallucinations in the indirect way referred to in a case reported by Griesinger:

"An intelligent patient (a medical student), who had throughout, hallucinations of the left side during a violent attack of insanity, had the impression that the voices did not come from the immediate neighbourhood; he had estimated them at a distance of several minutes. He also made the remarkable declaration that he could, by his belly, exercise voluntarily an influence on the hallucinations of hearing. On closer investigation it was seen that he meant the respiratory function of the

abdominal muscles, and that it was by means of the respiration that he exercised the influence. On holding the breath, the voices were often changed—appeared to come from a point nearer or more distant. We know that in expiration, the cerebro-spinal fluid arises from the spinal canal into the cavities of the brain and subarachnoid space (owing to the filling of the numerous venous plexuses of the canal of the spinal marrow), and that it again subsides during inspiration" (lxxxix, p. 90).

In Mr Galton's recent work already referred to (i, p. 56), he observes in speaking of those who have a complete mastery over their mental images, "They can call up the figure of a friend and make it sit on a chair or stand up at will; they can make it turn round and attitudinise in any way, as by mounting it on a bicycle or compelling it to perform gymnastic feats on a trapeze. They are able to build up elaborate geometric structures bit by bit in their mind's eye, and add, subtract, or alter at Will and at leisure. This free action of a vivid visualising faculty is of much importance in connection with the higher processes of generalised thought though it is commonly put to no such purpose, as may be easily explained by an example. Suppose a person was suddenly to accost another with the following words: 'I want to tell you about a boat.' What is the idea that the word 'boat' would be likely to call up"? (op. cit., p. 109). After giving several illustrations Mr Galton says that with one person, a philosopher, the word aroused no definite image, because he had purposely held his mind in suspense, and had vigorously exerted his Will not to lapse into any one of the special ideas that he felt the word boat was ready

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"An intelligent patient (a medical student), who had throughout, hallucinations of the left side during a violent attack of insanity, had the impression that the voices did not come from the immediate neighbourhood; he had estimated them at a distance of several minutes. He also made the remarkable declaration that he could, by his belly, exercise voluntarily an influence on the hallucinations of hearing. On closer investigation it was seen that he meant the respiratory function of the

abdominal muscles, and that it was by means of the respiration that he exercised the influence. On holding the breath, the voices were often changed—appeared to come from a point nearer or more distant. We know that in expiration, the cerebro-spinal fluid arises from the spinal canal into the cavities of the brain and subarachnoid space (owing to the filling of the numerous venous plexuses of the canal of the spinal marrow), and that it again subsides during inspiration" (lxxxix, p. 90).

In Mr Galton's recent work already referred to (i, p. 56), he observes in speaking of those who have a complete mastery over their mental images, "They can call up the figure of a friend and make it sit on a chair or stand up at will; they can make it turn round and attitudinise in any way, as by mounting it on a bicycle or compelling it to perform gymnastic feats on a trapeze. They are able to build up elaborate geometric structures bit by bit in their mind's eye, and add, subtract, or alter at Will and at leisure. This free action of a vivid visualising faculty is of much importance in connection with the higher processes of generalised thought though it is commonly put to no such purpose, as may be easily explained by an example. Suppose a person was suddenly to accost another with the following words: 'I want to tell you about a boat.' What is the idea that the word 'boat' would be likely to call up"? (op. cit., p. 109). After giving several illustrations Mr Galton says that with one person, a philosopher, the word aroused no definite image, because he had purposely held his mind in suspense, and had vigorously exerted his Will not to lapse into any one of the special ideas that he felt the word boat was ready

to call up, such as a skiff, wherry, barge, launch, punt, or dingy. Much more did he refuse to think of any one of these with any particular freight or from any particular point of view." Hence Mr Galton concludes that the habit of suppressing mental images must be a characteristic of men dealing much with abstract ideas. In fact the power of visualising among philosophers dies of inanition. It might have been expected, and it is actually found to be so.

A medical friend, now dead, had a remarkable power of voluntarily visualising faces, sometimes those of persons he had once known, sometimes not. I induced him, as he was an excellent draughtsman, to draw these figures, and I exhibited them at the annual meeting of the Medico-Psychological Association in 1874.

The influence of Volition on common Sensation is illustrated by the following case:—A distinguished physician in the province of Anvers, is able to produce at any time of the day, in any part of the body, by his Will, a more or less severe pain, variable in intensity, and the ease of inducing it, according to the part of the body. In the joints the pain irradiates to every part of the limb below; in the cervical region to the whole head; in the back, there is a sense of constriction in the chest; if in the loins, there is pain in the abdomen. It is, however, in the palms of the hands that these effects of the Will in inducing sensation are best marked. Elsewhere the pain disappears whenever the Will producing it ceases to be exerted, but in the hands the pain persists for a long time and even smarts severely, and he can only escape it by a powerful distraction of mind.

It must be added that during the time the doctor induces this pain in a part of his body, the pulsation of the vessels is sensibly increased in the locality* (xlviii, p. 132).

SECTION II.—Influence of the Will upon the Voluntary Muscles

The influence of the Will on the muscles has not, for us, the same interest as that of the involuntary action of ideas and of the emotions, inasmuch as it mainly refers to those ordinary movements which, from their essential and patent character, constitute in the popular mind the typical examples of the influence of Mind upon Body, and which require no illustration, and but little commentary beyond what has already been made in the previous chapter.

The acknowledged conditions upon which the successful exercise of the Will upon the voluntary muscles depends are—that there should be a clear conception of the thing willed in the hemispheres; integrity of the descending fibres, motor centre, and centrifugal nerves; and, generally a full belief in the power to exercise the Will.

The power of the Will over the voluntary muscles, as shown in the successful attempts to stimulate nervo-muscular disorders, should not, however, be overlooked in this section.

There are two admirable instances to which we will briefly refer; the one that of Dr Calmeil of Paris, the other,

* These facts are given by the medical man referred to in a letter to Dr Warlomont, of Brussels, dated Dec. 30, 1874 (xlviii).

that of a malingerer who has recently made himself notorious in the London Hospitals. Esquirol maintained that no one could successfully feign an attack of epilepsy, not even those who were thoroughly familiar with all the symptoms. "One day," says Trousseau, "Dr Calmeil and I were talking with Esquirol on this very subject, at the Asylum of Charenton, when suddenly Dr Calmeil fell down on the floor in violent convulsions. After examining him for a moment, Esquirol turned round to me, exclaiming 'Poor fellow! he is epileptic!' But he had no sooner said so, than Dr Calmeil got up and asked him, whether he still insisted on thinking epilepsy could not be feigned"? (liv, I, p. 42). The doctor's reply is not given. This illustration shows, not only the power of the Will in throwing the muscles into seemingly convulsive action, but the shallowness of the objection sometimes made against hypnotic phenomena, that they *may* be feigned, and, therefore, they probably are so, or at least that it is so difficult to distinguish between the false and the genuine that it is not safe to accept them as facts. Mr Braid used to say that if any one was silly enough to play a trick upon him, it was quite possible he might be deceived. The inference that Braidism is an imposture, is just as reasonable as to infer that all epileptic seizures are feigned, because Calmeil succeeded in deceiving so practised an observer as Esquirol.

The other case referred to, will be found reported in the 'Lancet,' for February 17th and April 13th, 1872. The patient, who usually professed to have been a medical man, contrived to deceive "many physicians and surgeons of great eminence," so well did he force his muscles to

assume the condition of paralysis, convulsion, or rigidity, which he desired to stimulate. "Who," says the above journal, "would have believed in the possibility of simulating tetanus for a week, or ten days, or more?" and adds that "the case has always excited the greatest interest both in professors and students, and the notes have always been taken with that care and voluminousness which the rarity of the case demanded. . . His symptoms were usually those of hemiplegia, with great rigidity of the paralysed muscles, and tetanic spasms of the opposite side. On one occasion he presented the appearances of true traumatic tetanus, and the surgeon under whose care he was at this time, said he could hardly discover a flaw anywhere in his imitation. During one of his series of simulations, a very large and painful carbuncle formed on the back of his neck, and his life was really endangered, his pulse being 150. He was evidently alarmed at his condition, and his strength was much reduced; *and yet he never forgot his opisthotonos*, but pertinaciously ground his carbuncle against his pillow." As showing the influence of Mind over Body in another way, one physician observes, "I think the case an interesting one, for he is clearly not an ordinary rascal. He must have much of that mental condition seen in hysterical women." It having been observed at one hospital that, notwithstanding the tetanic spasm of his limbs, the muscles of the abdomen were lax, these became subsequently as hard as boards." In one hospital he presented all the appearances of left hemiplegia. A few days after admission he became affected with convulsive spasms of the paralysed side. "The gradual onset of his symptoms:

from slight, at first, to the most grave in the end, was admirably assumed, and was so like the book description of 'ingravescent apoplexy,' that the idea of imposture seemed really absurd." During the same year, having fallen down in "a fit" near St. Paul's Churchyard, he was taken to a hospital, where, soon after admission, paraplegia appeared. Some months afterwards, he fell down again in London, and at another hospital was treated for hemiplegia during two months. Three months later he was admitted at a provincial hospital with well-marked symptoms of hemiplegia, the paralysed limbs being rigid. In less than a week he stated he felt much better, and wished to be discharged. On the same day he was seen walking about the streets perfectly well. He was subsequently a patient in at least four more hospitals, and was very successful in his simulations. In one instance "he had an attack of tetanus, complete in every particular. Every spasm was noted, and it is certain that the amount of sleep which he got during the time was incredibly small. A student sat up with him almost every night, and the slightest changes were taken note of and reported. We are told that it was really beautiful to watch the effects of remedies in relieving the poor patient's agonies. On the 19th he left the hospital in a fit of indignation, because he heard a nurse say she thought he was shamming. During his fourteen days' sojourn he consumed 234 ounces of whisky or brandy, and on the first four days he had 18 hypodermic injections of morphia, containing one-third of a grain each.

Voluntary power over the muscles may be lost, and yet Emotion may be able to excite their action; and, *vice*

versâ, emotional influence may be suspended and voluntary power remain.

Thus, a gentleman, known to me, is the subject of paralysis of the nerves supplying the tongue and palate. The affection came on rather suddenly, but, for many years before, he had suffered from the effects of a serious accident to the head, in consequence of which the brain was permanently injured. There was not, however, any sign of paralysis. The paralytic attack above mentioned was marked by inability to articulate or to chew his food, while the muscles supplied by the *portio dura* and the third pair were unaffected. He had no difficulty in expressing himself by signs or in writing. This state has continued for several years without material alteration. Now, in this case, emotional excitement frequently has the effect of enabling him to articulate a sentence or two, although muffled in character.

Romberg gives two interesting cases illustrative of the class of facts now referred to.

The first was that of "a widow, æt. 50, who had already passed through two apoplectic attacks, causing loss of speech and paralysis of the left side, the former occurring after violent vexation. The face of the patient was perfectly smooth, without either furrow or expression. All the muscles of the face were deprived of voluntary movement. She was neither able to contract her forehead nor her eyebrows, to raise the nostrils, nor to move her cheek and chin. She was incapable of closing the eyelids; when required to do it, she used her finger or looked on the ground, by which the eyeball was directed downwards; the levator tarsi relaxed in its contraction,

and the upper eyelid also moved downwards. On the other hand, she was not able to raise or close her lips, so that the mouth was constantly opened slightly, and the saliva ran out, rendering it necessary for the patient to be constantly wiping her lip. The lower jaw was moveable, the patient was able to open her mouth and chew; but even these movements were not quite of a healthy character, for she was unable to open the mouth wide, and she was equally incapable of performing rapid movements of the lower jaw upon the upper jaw. The tongue did not obey the Will in the least; she was neither able to protrude it between the teeth, nor to move it backwards or to the sides; it lay in the mouth like a wedge, and rendered voluntary deglutition and mastication almost impossible. The sense of taste, as well as tactile sensation, were unimpaired, both in the tongue and throughout the surface of the face. Speech was impeded, but there was not complete aphonia, for the patient was able to utter an inarticulate sound, but it was out of her power to modulate its pitch. The sound was not a distinct vowel, but something like *ang* or *ong*, for even when the mouth was wide open she was unable to say *a* distinctly, much less to articulate any other vowel."

On the other hand, while the Will could not influence the contraction of these muscles, their action was excited by direct or reflected stimulation, if we may call emotional excitement direct, and that which arose from without, reflected. A ludicrous idea—an internal excitor—at once excited the muscles employed in laughter. "The patient smiled and laughed, passing through all the shades of the movement without any difficulty, and at the same time the

lip, cheeks, and nostrils went through the same movements which a healthy person can perform, but over which our patient had no control. They were as little induced by any external stimulus, as pricking or pinching the cheek. When she laughed, she was also able to produce other sounds besides those mentioned. These sounds were also inarticulate, but still they varied in their elevation according to the character of the emotion that caused the laugh, a circumstance not otherwise observed. But it became evident how little these sounds were under the voluntary control of the patient when she laughed violently; she then uttered a peculiar, grunting, animal sound, of which she was in a measure ashamed and would willingly have suppressed. She therefore tried to shorten it as much as possible; however, the sound continued even after the movements of laughter had ceased, at a time when in a healthy individual no further sound would have been emitted" (abridged from xxxiv, ii, p. 278).

This patient subsequently died of cholera, and a post-mortem examination disclosed a hæmorrhagic cyst, the size of a small walnut, at the external edge of the right hemisphere, at the junction of the anterior and middle lobes.

In the following case, the Will *retained* its influence over the muscles supplied by the facial nerve, when the emotions were powerless:—

The right side of the face of a girl, æt. 12, was "expressionless in emotions, and showed no increased action in accelerated respiration, after running, &c. Nevertheless, the child was as able to control the muscles on this

side as those on the left; she could move the angle of the mouth, dilate her nostrils, wrinkle her forehead, and contract her eyebrows at will. There was no marked change in the sensation of the right side. The movements of mastication were undisturbed at either side when the child was regarded full in the face, while in a state of repose the mouth was found to slant, as in the usual instances of sudden peripheral paralysis of the facial nerve; but as soon as the features (of the sound side) were altered by emotions or by talking, the unequal action of the two sides of the face became manifest.

“The child was delicate, and the malady was developed gradually. Besides, there was a deviation of the vertebral column, between the scapulæ, of about one third of an inch from the straight line to the left, and the right half of the thorax appeared sunk to the same extent” (xxxiv, ii, p. 280).

The various forms or modifications of respiration—sighing, yawning, sobbing, laughing, coughing, and sneezing—can be performed, or at least imitated by the Will; but, when not excited by local irritation, are usually induced by the mental stimuli comprised under our second division of mental states—Emotion.

Hunter, who, not only by his writings, but by the disorders of his own body, serves a useful purpose in the present investigation, had a remarkable attack, during which he was able to keep up respiration by the Will. We read in his biography that “he once suffered from an alarming spasm attended by a cessation (?) of the heart’s action, which lasted three quarters of an hour, in defiance of various active remedies suggested by Dr

Hunter, Sir George Baker, &c. . . . The immediately exciting cause was a violent mental affection. During this attack the sensation and voluntary actions continued unaffected, and Hunter continued to respire by a voluntary effort, with a view of keeping himself alive ; though, as he afterwards observed, the continuance of respiration was probably of no service, as the circulation had ceased" (ii, i, p. 45).

In vocalisation the action of the Will on the vocal muscles is greatly influenced by the sense of hearing, persons born deaf being unable to direct their movements so as to produce intelligible sounds. In deglutition the Will can only be said to act indirectly, namely, supplying the required stimulus—the saliva or food. The muscles engaged in urination and defecation are, of course, largely influenced by the Will. It is unnecessary, however, to do more than refer here to works on Physiology.

The Will also possesses the power of controlling, within certain limits, the reflex action of the voluntary and semi-voluntary muscles, both in health and disease, whether excited by ideas, sensations, or local irritation without sensation.

Although ideo-motor acts presuppose the Will's abeyance, and the cerebrum's automatic action, it may be said that the Will is constantly engaged, except in sleep and allied conditions, in limiting, directing, and controlling the automatic or reflex action of the brain, and the muscular movements resulting therefrom.

An involuntary malediction half escapes the mouth, and is checked by the forcible repression of the Will. In the early stages of insanity, the conflict between the

Will and automatic cerebro-muscular action is often, as we all know, intense.

The influence of the Will, in controlling consensual movements, is sufficiently well shown in the familiar instance of the resistance which can be offered to the contraction of the orbicularis, if forewarned; we resolve not to yield to the attempt to startle us into winking, or to the motions which naturally ensue from tickling the sole of the foot, &c.

Voluntary efforts to control or suspend true excitomotor movements, as in respiration, defecation, &c., though for a time successful, are in the end, and in no long time, defeated by the irresistible force of the spinal nerves, or rather cord.

We may see this in animals as well as in man. For example, my cat is troubled with a bad cough, which comes on in paroxysms. The other day, when one of these attacks occurred, she heard a mouse behind the skirting board near her. Her attention was immediately arrested, and the cough ceased; the moment before in a state of distress, she was now lively and excited. After a while, however, a struggle occurred between the two forces, derived from the volitional and respiratory centres. She stood ready for a spring, and was most anxious to be perfectly quiet, but she could not prevent occasional coughs, which would effectually frighten away her intended victim. Reflex action was not entirely under the control of the Will, but was notably checked by it.

The following simple example, occurring in John Hunter's practice, serves to show the power of the Will in antagonising reflex action :—A woman, aged 46, was

troubled for some years with spasmodic wry neck. This contraction of the sterno-mastoid it was always in her power to prevent by contracting the muscle of the opposite side, when she sufficiently recollected herself. The affected muscle did not contract itself, unless she accidentally contracted it a little, after which it continued till the full effect was produced.

A good illustration of the same power occurs when aroused from sleep by simple cramp of the gastrocnemius ; we are able, by the vigorous exertion of the Will, to extend the muscle in spite of powerful reflex action to the contrary.

The suspension of the Will, from whatever cause, allows of the free play of the centres below the cerebrum, and thus explains the reflex acts which occur after mental shock.

In addition to its action through the nervous system upon the purely voluntary muscles in producing movements, the Will can exert a certain active influence over those of the semi-voluntary class engaged in respiration, deglutition, urination, and defecation.

SECTION III.—Influence of the Will upon the Involuntary Muscles and the Organic Functions

The direct action of the Will upon the heart and non-striated muscles of organic life, if it can be ever exerted, is altogether exceptional, although it may powerfully influence them *indirectly*, by directing the course of the emotions and ideas to them, and in this way it may and does affect the organic functions.

The alleged occasional direct action of the Will over the heart and non-striated muscles is of physiological interest, although, if admitted, of too rare occurrence to be of much practical importance.

A distinguished Fellow of the Royal Society* (æt. 79) told me that he could, by voluntary effort, increase the frequency of his pulse from 10 to 20 beats in the minute. He acceded to my request to make the experiment, with some reluctance, from a sense of danger accompanying it, or at least a conviction that it was not desirable for his health. On being seated, the pulse was, I found, 63, soft and regular. In the course of about two minutes, it increased in frequency to 82. On requesting him to tell me how he attempted to accelerate it, he said that he could hardly describe the character of the effort, but that it seemed to be partly due to "a sort of impulse, accompanied by an internal shiver, and partly to an action upon the breathing." As, however, the mere direction of the Attention to the heart is sufficient, under certain circumstances, to increase the number of its beats, it does not seem necessary to suppose that the Will acted directly upon the muscular tissue of the heart, in the same sense as we speak of its acting upon the voluntary muscles. The writer, is not, however, able himself to increase the frequency of the pulse by the concentration of the Attention. In regard to the respiration, his experience is the same, nor was there in this gentleman's case, any apparent increase in the respiratory movements.

The case of Colonel Townsend has been often adduced as an instance of the power of the Will in controlling the

* The late Robert Were Fox, F.R.S., of Falmouth.

action of the heart; but interesting and remarkable as the phenomenon he exhibited was, the Will possibly acted only indirectly on this organ, the cardiac symptoms resulting from a peculiar condition of the nervous system, self-induced, and resembling that occasionally occurring in Artificial Somnambulism. Dr Carpenter inclines to this view, "for in this condition," he observes, "there is sometimes an extraordinary retardation of the respiratory movements and of the pulsations of the heart, which, if carried further, would produce a state of complete collapse" (viii, p. 1103). Calmeil thinks that it need not occasion much surprise if the Will should, in some cases, be able to suspend the action of the heart; and certainly, if in at least one instance, about to be mentioned, voluntary rumination has occurred, there is no reason why an exceptional distribution of the nerves should not have enabled Colonel Townsend to influence his heart even directly. The statement respecting him is that "he possessed the remarkable faculty of throwing himself into a trance at pleasure. The heart ceased, apparently, to throb at his bidding, respiration seemed at an end, his whole frame assumed the icy chill and rigidity of death, while his face became colourless and shrunk, and his eyes fixed, glazed, and ghastly; even his mind ceased to manifest itself, for during the trance it was as utterly devoid of consciousness as his body of animation. In this state he would remain for hours, when these singular phenomena wore away, and he returned to his usual condition" (lxxxv, p. 231). Dr Cheyne, Dr Baynard, and Mr Skrine believed on one occasion that life was extinct, and were about to leave the Colonel, when signs of

returning animation appeared. They felt his pulse. "It was," says Dr Cheyne in his 'English Malady,' "distinct though small and thready, and his heart had its usual beating. He composed himself on his back and lay in a still posture some time; I found his pulse sink gradually, till at last I could not feel any by the most exact and nice touch. Dr Baynard could not feel the least motion in his breast, nor Mr Skrine see the least soil of breath on the bright mirror he held to his mouth; then each of us by turns examined his arm, heart, and breath, but could not by the nicest scrutiny discover the least symptom of life in him." They waited some time, and the body continuing in the same state, were about to leave, under the impression that the Colonel was actually dead, when a slight motion of the body reassured them. Upon examination the pulse and heart were found again in action, and he gradually restored himself. His death-like state lasted half an hour, and recurred at nine in the morning, after which he transacted business with his attorney, and quickly expired at six o'clock in the afternoon; and the body, when examined, presented, with the exception of the right kidney, no sign of disease (see xxvi, p. 160).

Dr Darwin says, "There is an instance told in the 'Philosophical Transactions' of a man who could for a time stop the motion of his heart when he pleased; and he adds the case of a gentleman who could so far increase the peristaltic action of the bowels by voluntary effort, that he could cause their action at any time in half an hour" (lxxv, i, p. 39).

In this connection, the prolonged suspension of active

vitality in the Fakirs, authenticated by English officers and medical men, and referred to by Mr Braid and Dr Carpenter, is important, as being probably induced by the Will forcibly concentrating the Attention upon one subject, and leading to a condition of the organic functions similar, in some respects, to that of Colonel Townsend. St Augustine gives a case of voluntary trance in the 'De Civitate Dei' (Opera, Edit. 1569, vol. v, p. 796) : —“ Jam illud multo incredibilius, quod plerique fratres memoriâ recentissimâ experti sunt. Presbyter fecit quidam nomine Restitutus in parœcia Calamensis ecclesiæ, qui quando ei placebat (rogabatur autem ut hoc faceret ab eis qui rem mirabilem coram scire cupiebant), ad imitatas quasi lamentantis cujus libet homines voces, ita se auferebat a sensibus, et jacebat simillimus mortuo ; ut non solum vellicantes atque pungentes minime sentiret, sed aliquando etiam igne ureretur admoto, sine ullo doloris sensu nisi postmodum ex vulnere ; non autem obnitendo, sed non sentiendo non movere corpus, eo probabatur, quod tanquam in defuncto nullus inveniebatur anhelitus : hominum tamen voces, si clarius loquerentur, tanquam de longinquo se audisse postea referebat.” In hypnotism, the process suspends the influence which antagonises that of the sympathetic over the calibre of the cerebral arteries, but this is due to exhausting the cerebrum, by straining the muscles of the eye, and by the concentration of the Attention, which are both dependent on the Will. It does not act, however, directly upon the calibre of these vessels, nor is there sufficient proof that, in any instance, the individual Will has been able to act directly upon the arteries of the body, apparent examples of this power

being attributable to rigidity of the surrounding muscles, or to emotional states, excited by the Will.

In considering the possibility of the Will acting upon non-striated muscles in some instances, we must not omit to mention that Peter Frank and Blumenbach record two cases of great interest. In that related by the former, the power existed of commencing the act of rumination by the direct exercise of the Will. In Blumenbach's case a patient affected with rumination was able to arrest it by volition (xxxiv, ii, p. 14).

Voluntary rumination is incidentally mentioned by St Augustine in the following passage, the whole of which is worthy of preservation:—"Sunt qui et aures moveant vel singulus, vel ambas simul. Sunt qui totam cæsariem capite immoto quantum capilli occupant, depouunt ad frontem, revocantque cum volunt. *Sunt qui eorum quæ voraverunt incredibiliter plurima et varia, paululum præcordiis contrectatis, tanquam de sacculo, quod placuerit, integerrimum proferunt.* Ipse sum expertus, sudare hominem solere cum vellet. Notum est, quosdam flere cum volunt, atque ubertim lachrymas fundere" (loc. cit.). Voluntary perspiration, it will be observed, also finds a place in the above enumeration.

Of the muscles concerned in vomiting, the abdominal are, no doubt, more or less under the influence of the Will; but this act differs from the semi-voluntary, such as defecation, with which it is frequently classed, in that it cannot be performed by all persons voluntarily, at one time or other, in consequence of some of the muscles required by the act being altogether of the non-striated class. Romberg states that Bichat possessed the power

of voluntarily vomiting, and that Richerand cites an instance of it also. It would be interesting to know whether this power was exerted in these cases without any previous nausea whatever.

Dr Noble, of Manchester, has informed me since the first edition of this work appeared, that he himself is an example of "human rumination" (Richerand). "I am one of those," he writes, "who have always had the power of voluntary vomiting and it is not ever preceded by any nausea whatever. The feat is performed by depressing the diaphragm and employing the abdominal muscles, by the Will, no sickness whatever being induced."

The examples, however, of alleged voluntary control over the heart, stomach, and oesophagus, are so rare that, at most, they only prove that exceptions may occur to an almost universal rule, and are of no practical utility.

The exceptional influence of the Will over non-striated muscle, is exhibited in the power possessed by some persons of contracting or dilating the pupil at pleasure. Professor Laycock states that a gentleman now living (1860) possesses this power. He does not say whether the action of the Will was direct, or through the medium of ideas.

The case of Prof. Beer, of Bonn, is thus described in the 'British and Foreign Medico-Chirurgical Review,' on the authority of Budge:—"He is able in the same light to contract or dilate his pupil at will. This change in the size of the pupil, however, he brings about only through certain ideas; when, for example, he thinks of a very dark space, the pupil dilates. When, on the contrary, he thinks of a very light place, the pupil con-

tracts. He finds it more difficult to induce contraction than dilatation. Dilatation would seem easier than contraction for Budge "has met with several other persons who can dilate the pupil in consequence of such ideas, but not another who can contract it also." The reviewer holds that from such cases we must conclude, "not that the motion of the iris is voluntary, but that the idea of a sensation can bring forth motions as well as the actual sensation itself" (vii, 1857). Again: "Professor Allen Thompson, of Glasgow, has lately published, in the 'Glasgow Medical Journal,' some remarks on the case of Dr Paxton, of Kilmarnock, who possesses an unusual power of contracting and dilating the pupil, alleged to be voluntary and independent of any effort at adjustment of the eye. Dr Paxton showed Dr Thompson the motions of his iris, "alternately contracting and dilating the pupil to a great extent, with apparent ease, at will;" and he informed Dr Thompson "that although, in producing the motions of contraction and dilatation of the pupil, he did not actually make an effort of adjustment, or attempt to fix the eye alternately on a near and distant object, yet the effort to make either of these motions seemed to him, as it were, very similar to the motions for adjustment." [Mr Braid found that "by directing the eyes loosely, upwards or downwards, to the right or to the left, as if looking at a very distinct object, the pupils become very much dilated, irrespective of the quantity of light passing to the retina, so that in this manner we can contract the pupil at will" (vi, p. 36).] Dr Paxton further stated to Dr Thompson, in proof of his possessing a power greater than usual of moving the iris indepen-

dently of adjustment, that he "can fix the eyes upon a near object, and, while steadily looking at it, dilate the pupil without any effort for adjustment for distant vision, and while continuing to look at a distant object he can still further dilate the pupil and contract it at will, without any attempt at adjusting the eye for near vision." In short, as Dr Paxton himself informs me in a letter, "he can alternately dilate and contract the pupil with as much facility as he can open and shut his hand," and that, without the slightest effort at adjustment. This he can do also more rapidly than the pupil can adjust itself for near and distant vision. The pupil, Dr Paxton says, has the ordinary action under the influence of light and shade, but he can always at will dilate it, whether the eyes be exposed to light or shade.

It is "by dilating that he must always begin the movements in question. By a slight effort of what appears to him to be relaxation, he dilates the pupil, and when the pupil is dilated, he can, by a slight effort of bracing up, contract it. Furthermore, Dr Paxton says *that it is not by raising up any idea in the mind, such as thinking of light and shade, that he calls forth the movements of his pupils, but by distinct efforts*, and that he is always conscious, both by the state of vision and by the sensation in the eye, whether the pupil is in its normal condition or not" (vii, October, 1857).

More recently M. Ch. Féré has drawn attention to the action of the Will on the pupil in his "Notes pour servir à l'histoire de l'hystéro-épilepsie," in the 'Archives de Neurologie, 1882 (p. 281). He observed that in two hystero-epileptics during the cataleptic stage, when he

ordered them to look (mentally) at a bird at the top of a clock or soaring high into the air, the pupils progressively dilated to double their normal size. When, on the contrary, he gave the patient the impression that the bird was descending, the pupils gradually contracted. This observation well illustrates the influence, not of the will on the pupil, but of ideas corresponding to external stimuli. Seitz-Zehender ('Handbuch der Augenheilkunde,' p. 14) is cited as reporting the case of a medical student who could dilate his pupils three millimètres by inspiring deeply, and then stopping his breath and contracting the muscles of his neck. Leoser explains this by supposing that the oculo-pupillary vaso-motor centre in the medulla is irritated at the same time as the respiratory centre, probably from the carbonic acid accumulated in the blood.

M. Féré thought it worth while trying whether the pupils of his hysterical patients would, when they were awake, respond to imaginary representations as in the case of Prof. Beer, but he failed to induce either contraction or dilatation. As we have seen, the experiment was successful during the cataleptic state. Again, during this or the hypnotic condition, M. Féré possessed the patients with the idea that on a table of sombre colour there was a portrait in profile. On being awakened they saw it distinctly *in situ*, and in placing a prism before them they were extremely surprised to see two profiles. Lateral pressure of the globe sufficient to disturb the visual axis also induced diplopia, as had been already recorded as holding good in an instance of hallucination in a lunatic (Brewster), and in a male hysteric (Ball).

The desperate effort to awake from partial sleep

which we are at times conscious of making, might seem to be, when successful, an instance of the influence of the Will over the vessels of the brain ; but what happens? The Will acts in two ways—first, the very effort to arouse oneself from sleep, excites the inhibitory action of the brain upon the sympathetic ganglia, which, uncontrolled, cause the contraction of the cerebral vessels as referred to vol. i, p. 130, of this work ; secondly, the voluntary muscles are gradually excited to action. But if the brain be in the peculiar condition present in trance, there may be consciousness and the strong desire to wake, without the power. In other cases, the fearful struggle may at last end in cerebro-spinal victory, and an escape from the grip of the sympathetic. Crichton gives such a case, that of a young lady who, in this state, was laid in a coffin. “ On the day of her funeral several hymns were sung before the door. She was conscious of all that happened around her, and heard her friends lamenting her death. She felt them put on the dead-clothes, and lay her in the coffin, which produced an indescribable mental anxiety. She tried to cry, but her mind was without power, and could not act on the body. It was equally impossible to her to stretch out her arms, or to open her eyes, as to cry, although she continually endeavoured to do so. The internal anguish of her mind was, however, at its utmost height when the funeral hymns began to be sung, and when the lid of the coffin was about to be nailed on. The thought that she was to be buried alive was the first one which gave activity to her mind, and caused it to operate on her corporeal frame. Just as the people were about to nail

on the lid, a kind of perspiration was observed to appear on the surface of the body. It grew greater every moment, and at last a kind of convulsive motion was observed in the hands and feet of the corpse. A few minutes after, during which fresh signs of returning life appeared, she at once opened her eyes, and uttered a most pitiable shriek" (lxiii, ii, p. 87). In this case the first indication of the relaxation of the capillaries, gradually freed from the excessive contracting influence of the sympathetic ganglia, was perspiration.

In concluding the consideration of the Will, it may be said that the great fact to be borne in mind in regard to the range of its operation is that, while it cannot influence (unless in a few rare case) the organic functions directly, it can indirectly, through its employment of other mental forces, and can exert immense influence over the irregular movements of the muscles and automatic cerebral action.

PART IV
INFLUENCE OF THE MIND UPON THE BODY
IN THE CURE OF DISEASE

CHAPTER XV

GENERAL PSYCHOLOGICAL AND PHYSIOLOGICAL
PRINCIPLES

HAVING considered the influence of varying mental states upon the bodily functions, both in exciting their physiological and pathological action, we proceed to illustrate the effects of the same influence upon morbid conditions of the system. John Hunter only stated the truth of the case partially when he said, "As the state of the mind is capable of producing a disease, another state of it may effect a cure," if by this he meant to imply that a different kind of emotion is required to remove a disease from that which caused it, whereas the character of the mental excitor may be, and often is, the same in both instances. Fear may heal as well as cause disease. It would therefore be more correct to say that as in health certain mental states may induce disease, so in disease certain mental states may restore health.

The Illustrations which we shall bring forward may seem to some a thrice-told tale and of little practical use, but they are, in the author's opinion, of great importance on several grounds, but especially so in regard to the question whether the psychical cures of disease performed by Mesmerism and kindred processes, are due to a force proceeding from A the healer to B the healed, or are simply the result of the particular mental state of B, excited by A. It is obvious that in those cases in which the individual's own emotion (*e.g.* Fear) causes changes in the body, there can be no influence derived from the hypothetical disease-healing emanation of another person; and if the cures are as frequent and as complete under these conditions, there is no occasion to assume that any other principle is at work in those cases in which the cure is preceded by some particular action on the part of another. If, on the other hand, it is found that although certain emotions, as Fear, exert a marked effect in removing morbid conditions of the system, the presence or contact of some individuals possesses a still greater influence; or if while an ordinary mortal can act upon a patient's disease beneficially, by designedly exciting his Imagination, his Will, or his Hope, a Valentine Greatrakes can, by the touch of his hand, exert an entire and instant influence, which takes effect in a larger number of instances—an effect which is more powerful in its operation, and one asserted by him to be an accidentally discovered gift, practised without any regard to the supposed action of the Imagination—then a different principle may be suggested, but it is not proved by these circumstances, for the question still arises whether B's fear of,

or faith in A, does not even then constitute the real explanation of the effects produced. A man possessing—

“An eye like Mars, to threaten and command.”

is certainly much more likely to influence the nervous system of B than if destitute of an expression indicating force of will. The strongest argument in favour of the possession of a distinct power on the part of Great-rakes is that drawn from the circumstance that the sense of an overwhelming mental force or impulse was, in the first instance, the cause of his applying his hand to parts affected with disease. It may fairly be asked, why was he successful before there was the least reason to expect any remarkable effects from his “stroking”? This early success, taken in connection with the impulse which he experienced, ought at least not to be overlooked by an honest investigator of the success of his method, as witnessed by Boyle and other acute observers, for it is certainly the most difficult circumstance to explain merely by the action of the patient’s mind upon the disease. At the same time, although it is difficult to conjecture why he had an impulse to heal by stroking, it is certain that no one could be stroked without having the attention more or less strongly directed to the seat of the disease, and that the mere process of stroking may be of great use in altering the capillary circulation of the part, in the same way as the metallic tractors prove beneficial. In neither method must the physical element be overlooked.

But even should it be eventually shown that a power emanates from some persons as is alleged, which when

applied to disease exerts a salutary influence, the cases collected in this chapter will not be useless, for they will show what *can* be done without the contact of another person, and will serve as a warning not to conclude hastily that, in other cases, different powers have been exerted. Such emanating power is not intrinsically absurd. We recognise animal electricity; and the correlation of physical forces makes it difficult to see why animal magnetism should be regarded as impossible. Only, it would be altogether unphilosophical to have recourse to this or any odyllic agency, if the phenomena in question can be explained without it. The advocates of a magnetic fluid themselves admit that the Imagination may, as regards certain phenomena, produce in some instances the same results. The most able and prominent supporter of Mesmerism in this country, the late Dr Elliotson, says, "If a mesmeric effect has once been produced—an effect unquestionably of mesmeric agency—we cannot be sure when it recurs, even under mesmeric processes, that it is not the result of Imagination, if the patient is aware of mesmeric means being employed in order to induce it. Whether Imagination could induce a violent inflammation of the eyes, with a severe eruption on the skin, on a certain day fixed upon by the patient long before, I will not say; but that the idea of a fit of convulsions, pain, &c., occurring on a certain future day and hour, is sufficient to excite it at the very time foretold, I have no doubt, and many such apparent predictions are of this nature and no predictions at all, but results of a strong Imagination (xxxvi, January, 1853, p. 358).

So also Dr Gregory, the late Professor of Chemistry in the University of Edinburgh, in urging the proofs in favour of the occurrence of certain psychical phenomena independently of the Imagination, candidly admits that "the impressible state" may be caused by an appeal to this faculty. "It may be," says he, "induced by an internal change in the patient's nervous system, caused by what may be called an appeal to the Imagination, or in other words, by the physical effects of fixed gazing on the nervous system of him who gazes." Again, "It is certain that in the greater number of cases the impressible state is produced by means of an appeal to the Imagination of the patient, and when he is in that state, the very character of the phenomena now to be described consists in their connection with and dependence on the Imagination—that is, on mental impressions made on the patient. For this reason we call them the phenomena of Suggestion, or suggestive phenomena" (xxxvi, April, 1852).

The foregoing is equally true when applied to the cure of disease. In regard to the explanation, which some are disposed to find in Dr B. W. Richardson's "Theory of a Nervous Ether," of the relief of disease by mesmeric manipulations, it may be remarked that this ether might exist, but be incapable of passing from A to B, or it might thus pass and yet not be a curative agent. All Dr Richardson suggests is that there exists, in addition to a nervous fluid, a gas, or vapour, pervading the whole nervous organism, surrounding, as an enveloping atmosphere, each molecule of nervous structure, and forming the medium of the influences transmitted from a nerve-

centre to the periphery and from the periphery to the nerve-centre. This theory might be applied to explain the cure of disease by Mesmerism, so far as the means adopted may concentrate the nervous ether in one part, but this is quite a different thing from supposing that it escapes from the tips of the fingers, and exerts an influence over another person. So, in regard to the resemblance of nervous to electric force,* this affinity may be true, but such force may not pass from A to B. The admitted evolution of electricity in man does not appear to be present in unusual degree in those cases in which the power to heal disease by the hand is alleged to exist, and those persons who, like the lady and the monk, whose cases are cited by Carpenter in his 'Human Physiology,' have an excess of electricity, are not credited with any special healing gifts. Arago is stated† to have arrived at the following, among other conclusions, in a report to the Academy of Sciences, on a case more remarkable than the

* Sir Benjamin Brodie, adopting this hypothesis, observes that "the transmission of impressions from one part of the nervous system to another, or from the nervous system to the muscular and glandular structures, has a nearer resemblance to the effects produced by the imponderable agents than to anything else. It seems very probable, indeed, that the nervous force is some modification of that force which produces the phenomena of electricity and magnetism, and you may recollect that I have already ventured to compare the generation of it, by the action of oxygenized blood on the gray substance of the brain and spinal cord, to the production of the electric force by the action of the acid solution on the metallic plates, in the cells of a voltaic battery" (xxx, p. 159).

† Among other works, in an anonymous brochure, entitled, 'The Principles of Spiritualists exposed,' 1864.

foregoing, but I have been unable to verify the reference : “That, under peculiar conditions, the human organisation gives forth a physical power which, without visible instruments, lifts heavy bodies, attracts or repels them according to a law of polarity, overturns them, and produces the phenomena of sound.” Contrary to the opinion of Mr Braid he, according to the same report, believed that a peculiar sensibility to the magnet sometimes exists. It is to be hoped that the interest at present (1872) excited in so-called “ Psychic Force ” will lead to a more extended and patient examination, on the part of competent observers, of such phenomena. Whatever may be eventually proved, it will not be the less true, *first*, as regards our immediate inquiry, that if B’s Expectation, Will, or Emotion, cure his disease as effectually without as with the presence of A, it is unphilosophical to assume any other curative agent to be present ; and, *secondly*, that it does not follow that because the Emotion or the Imagination can cure disease, that therefore there can be no beneficial influence proceeding from A to B.

patient's spiritual instructor, and his command, 'in the name of the Saviour, that she should get up and walk' " ('Diseases of the Joints,' 1850, p. 287).

When we see that the mental emotions caused by the fall from a donkey, cure a disorder of which Dr Copland says, there are few less under the control of medical treatment, we can scarcely exaggerate the importance of attacking Disease psychologically, although we may not be justified in inducing donkeys to throw our lady patients, any more than resorting to the somewhat expensive as well as perilous remedy of setting on fire the house of any gentleman labouring under an attack of gout.

The case which follows not only shows that the symptoms of an emotional disorder, functional in character, may so closely resemble one involving organic disease, that two distinguished surgeons may confound them (and it may be added that what happened "many years ago" may happen now, if not with experienced hospital surgeons, with general practitioners);* but it also presents a good example of the cure of an hysterical affection of the joint by an exclusively psychical remedy.

"Many years ago," says Mr Skey, "when I was less familiar with hysteric affections, I attended the case of a young lady of nineteen (suffering from a painful affection of the knee) in conjunction with Mr Stanley. We both deemed the disease to belong to the class of inflammation and conjointly adopted the usual remedies so indiscriminately resorted to in all painful affections of the joints. Many weeks elapsed without improvement, and I remember that we discussed with some anxiety the probable

* Brodie confesses he had often made the mistake himself.

issue in abscess, destruction of ligaments, absorption of cartilage, and ultimate amputation of the limb! One day my patient informed me that her sister was going to be married, and that cost what it might, she had made up her mind to attend the wedding. At this proposal I shuddered. Having expatiated to no purpose on the probable consequences of so rash an act, with all the force of language I could command, I determined to give stability to the joint for the occasion and I strapped it up firmly with adhesive plaster. On the following day I visited her. She told me she had stood throughout the whole ceremony, had joined the party at the breakfast, and had returned home without pain or discomfort in the joint. Within a week her recovery may be said to have been complete" (xlv, September 22nd, 1866).

Stirring political events, demanding individual action, have a wonderful influence over nervous affections. This fact was exhibited in the first American war. Dr Rush, after stating that many whose habits were infirm and delicate, were restored to perfect health by the change of place or occupation to which the war exposed them, adds;—"This was the case in a more especial manner with hysterical women, who were much interested in the successful issue of the contest. The same effects of a civil war upon the hysteria were observed by Dr Cullen in Scotland in 1745-6. It may, perhaps, help to extend our ideas of the influence of the passions upon diseases, to add that when either love, jealousy, grief, or even devotion, wholly engross the female mind, they seldom fail, in like manner, to cure or to suspend hysterical complaints" (lxi, i, p. 132).

Every one has heard the story of the doctor who left his prescription on the table for a lady who suffered from pleurodynia, saying, "Put this to your side," and how the patient literally did so, instead of obtaining the prescribed plaster, but, in spite of this mistake, derived great benefit from the application.

A parallel case of colic is mentioned by Dr John Brown, of Edinburgh. He ordered a labouring man some medicine, and giving him the prescription, said, "Take *that*, and come back in a fortnight, and you will be well." As he returned at that time hearty and well, free from the colic and sinking at the stomach, of which he had complained, and with a clean tongue and cool hand and a happy face, Dr B. was very proud of the wonders his prescription had effected, and said, "Let me see what I gave you." "Oh," said he, "I took it." "Yes," said the doctor, "but the prescription?" "I took *it*, as you bade me. I swallowed it;" that is, the paper itself! But the story is somewhat spoiled for our present purpose by the patient, who was accustomed to relieve his troubles by whisky, having been ordered to discontinue it, and live on broth and milk instead! So that the Imagination was, after all, the least important of the remedies.

SECTION II.—Influence of Mental States upon Disorders involving Excessive or Defective Action of the Voluntary Muscles

This division, like the corresponding one in previous chapters, is, of course, open to the objection that it is

based on a mere symptom, and that it would be more correct to take the nervous system as our guide. It will however, sufficiently serve our present purpose.

Epilepsy.—Sweetser cites from the 'Medical and Surgical Journal,' vol. xviii, the case of a lady in the prime of life, of robust health who was for four years afflicted with epilepsy in a violent degree, the paroxysms returning three or four times a week, continuing for some hours, and leaving the patient in a state of stupor. A variety of medicines had been tried in vain, and the case was considered hopeless, when, on receiving a dreadful mental shock, by the circumstance of her daughter being accidentally burnt to death, the disease entirely and finally left her" (xliii, p. 28.)

The old French Commission on Magnetism found, as I have already stated, that they could produce convulsions by acting upon the Imagination. But more than this, they found they could by the same talisman terminate them. "To prove incontestably, and to complete the picture of the effects of the Imagination, powerful alike to agitate and to calm, we have," say they, "put an end to a convulsion by the same charm which produced it, the power of the Imagination."

In like manner, in the case of the poor hystero-epileptic girl treated by Madame de St Amour, referred to at p. 65, "*Levez-vous,*" said the latter, "*vous êtes guérie,*" and the fit subsided.

In the 'Annales Medico-Psychologiques' for 1846, is the report of a case of epilepsy from which the following is condensed:—"Marie-Anne Saveret, Auxerre, was very much frightened when about fourteen years of age,

in consequence of which she lost her consciousness and was convulsed. In the evening she had another attack. This alarm occurred when she was subject to headache, irritability, indefinite pains, and other symptoms which indicated a critical period of life.

She had no return of these convulsive attacks until she was twenty-two years of age, when the catamenia appeared. The seizures are described by Dr Girard as epileptic, and as followed by momentary incoherence. Soon after maniacal attacks occurred and became so severe that it was found necessary to place her in an asylum. For about three years she remained there, having become one of the most violent and dangerous patients under Dr Girard's care, in spite of moral and medical treatment in a variety of forms. She escaped at length from the establishment, and for three months remained at large. Here a new moral force came into action; to escape detection she exerted all the self control at her command, and became calm and inoffensive. Though she does not appear to have entirely recovered, she remained free from epileptic attacks, coherent, and her habits were industrious and regular. In reporting this case, Dr Girard observes that if he were asked how a moral influence which provoked the attacks of epilepsy, can in a milder form (Fear), benefit, or even cure, so serious a malady, he should, in reply, demand an explanation of the cure of an ague by acting powerfully upon the Imagination. As he remarks, epilepsy and intermittent fever, both belong to the *neuroses*, and it is not astonishing that they alike respond to the same psychical influences.

Pertussis.—Fear used to be a popular remedy in this disorder, the noise and alarming appearance of a mill-hopper having been employed to frighten a child placed in the corn-bin. In 'Fraser's Magazine,' May, 1873, is recorded a case of hooping-cough which was cured by a good thrashing.

Hysterical contraction.—Every practitioner is familiar with hysterical contraction of the fingers. A young woman's fingers are firmly flexed upon the palm, and obstinately resist any attempt to extend them. All the orthodox pharmaceutical means may be employed and fail, even if, its true nature being recognised, it is not confounded with the effects of inflammation of the tendons or their thecæ, or of organic cerebral disease; and yet a cure may be performed in a few minutes by what is ordinarily understood by the Imagination, by a sudden thrill of Hope or Faith which masters the tonic spasm, and sets the fingers free. Dr Bertrand knew a woman whose hand, for thirty-eight years, had been closed as firmly as the fist of a boxer, and could only be opened by very considerable force; yet her hand, to his knowledge opened in response to the appeal of Madame de St. Amour. Whether it relapsed eventually into its former condition is not stated, but for three days, at least, it remained relaxed and as serviceable as the other. It is in regard to such cases (whether hysterical, or the remains of old disease) that Burton's pithy observation is but too true:—"An empirick oftentimes, or a silly chirurgeon, doth more strange cures than a rational physician. Nymanus gives a reason—because the patient puts his confidence in him, which Avicenna prefers before art, precepts, and

all remedies whatsoever. 'Tis opinion alone (saith Cardan) that makes or mars physicians; and he doth the best cures, according to Hippocrates, in whom most trust."

Mr Kingdon's case, reported to the Medical Society of London, of an old man, the subject of *paralysis agitans*, who was strikingly influenced by emotional excitement, is referred to by Dr Moore, in his 'Power of the Soul over the Body,' p. 310. He "had been long unable to walk. The child of a friend was admitted to see him, and so greatly delighted was he that he arose, walked across the room, filled a paper with small shells, gave it to the child, and then sat down as paralytic as before."

Paralysis.—Some years ago an intelligent sailor, whom I know, was left, among others, on one of the desolate Crozet Islands, in the Southern Ocean, and suffered greatly in consequence. A portion of the crew he describes as "seized with a strange sort of sickness, for they were all drawn up like cripples, some in a sitting posture with their heads resting on their knees, but in no pain, unless you went to move them, or they tried to exercise themselves to regain the use of their limbs." At last, a ship unexpectedly came in sight, and the sailors made large fires as signals of distress. "The sick men," he says, "got half well *at the sight of a fine ship*, some even beginning to crawl about on all fours, and gathering up anything that would burn, to keep the fires going."

It is, however, to definite cases of paralysis that we now wish to refer. Probably, in the above instance, the men suffered from scurvy.

Dr Bouchut states that in 1849 a little girl, Louise Parguin, whom excessive Fear had rendered dumb, and paralytic in all her limbs, was brought to him. "For two months everything had been done by the physicians, but to no purpose. In despair her father came with his child to Paris. The girl, who had heard of the great city, its great physicians, and the Hôtel Dieu," spoken of only in the most extravagant way, arrived full of faith to be cured. In the evening I saw her dumb and paralytic; and, displeased at finding such a patient in the hospital, made no prescription. She was in the same state the next morning; I put off all treatment during the day. During the day she began to speak, the day after to move her limbs, and on the third day she walked about the wards completely cured. Her faith had saved her" (lxviii, Jan., 1865).

Dr Abercrombie relates the following:—"A woman, mentioned by Diemerbroeck, who had been many years paralytic, recovered the use of her limbs when she was very much terrified during a thunder storm, and was making violent efforts to escape from a chamber in which she had been left alone. A man affected in the same manner, recovered as suddenly when his house was on fire; and another who had been ill for six years, recovered the use of his paralytic limbs during a violent paroxysm of anger" (xxviii, p. 399).

Sir Humphrey Davy's well-known case of cure of paralysis was due to aroused hope and expectation. He placed a thermometer under the tongue, simply to ascertain the temperature. As the patient at once experienced some relief, the treatment was continued for a fortnight

when it ceased to be required for the patient was well. This case is of interest from the application not having been made to the part affected; local excitement was not an element in the treatment; and the Attention was directed rather from than to the paralysed limb.

Dr Paris relates the circumstance in the following words:—"Early in life he was assisting Dr Beddoes in his experiments on the inhalation of nitrous oxide. Dr Beddoes having inferred that the oxide must be a specific for palsy, a patient was selected for trial, and placed under the care of Davy. Previously to administering the gas, Davy inserted a small thermometer under the tongue of the patient, to ascertain the temperature. The paralytic man, wholly ignorant of the process to which he was to submit, but deeply impressed by Dr Beddoes with the certainty of its success, no sooner felt the thermometer between his teeth than he concluded the talisman was in operation, and, in a burst of enthusiasm, declared that he already experienced the effects of its benign influence throughout his whole body. The opportunity was too tempting to be lost. Davy did nothing more, but desired his patient to return on the following day. The same ceremony was repeated; the same result followed; and at the end of a fortnight he was dismissed cured, no remedy of any kind except the thermometer having ever been used" ('Life of Davy,' p. 74).

The following and the last of these illustrations has done duty so many times that we are tempted to omit it, but we insert it for a reason which has determined the same course in many other similar instances—the

convenience to the reader of being able to put his hand upon the cases which he may be in quest of, bearing upon the same subject.

Herodotus relates that "during the storming of Sardis, a Persian meeting Crœsus was, through ignorance of his person, about to kill him. The king, overwhelmed by this calamity, took no care to avoid the blow or escape death; but his dumb son, when he saw the violent designs of the Persian, overcome with astonishment and terror, exclaimed aloud, 'Oh, man, do not kill Crœsus!' This was the first time (?) he had ever articulated; but he retained the faculty of speech from this event as long as he lived" (xliii, p. 27). Sweetser quotes from Van Swieten a case of hemiplegia of some years' standing, in a man, who was cured by sudden Terror.

Dr Mackey* has adduced the cases of healing at Lourdes, near Pau, as inexplicable by any other hypothesis than that of a miracle, and bases his conclusion upon the records contained in the 'Annales de Notre Dame de Lourdes' upon the authority of M. Lasserre, "a man of known honour and position," the narratives being substantiated by names, dates, and places. Dr Mackey, however, candidly admits that some cases may be paralleled in medical practice without question of the supernatural, and he justly likens some of the affections under which the devotees laboured to those under the care of M. Charcot at the Salpêtrière, cases of loss of sensation and of motor power, well known to the

* 'Dublin Review,' 1880, p. 386, "Miracles and Medical Science."

The above case was regarded by Dr Vidart as one of rheumatic affection of the spinal cord.

I the more readily cite these cases as examples of the influence of the Mind upon the Body, inasmuch as Dr Mackey, a member of the Roman Catholic Church, admits them to be such, and controverts the dicta of Père Bonniot that we ought to recognise the intervention of a cause superior to nature, when the cure is *instantaneous*, and that the cures effected by the Imagination are *infinitely* rare, and its power *excessively* limited.

But there are other cases which in this writer's opinion cannot be so explained, such as the instant union of an old fracture of the tibia, the reduction of a dislocation of the hip, and the sudden cure of varicose veins of the leg of thirty years' duration, by the waters of Lourdes, and he truly says, "such cases cannot cure themselves, and no amount of faith and hope that the mind of man can imagine will unite a broken bone, reduce a dislocation, or obliterate a varicose vein." We shall certainly not attempt to apply our principles here, but content ourselves with Virchow's brief explanation of other remarkable phenomena, "*supercherie ou miracle*," and abandon every case to which a parallel does not occur in the secular practice of scientific observation such as that conducted at the Salpêtrière.

In the 'Nineteenth Century,' November, 1882, Mr Richard F. Clarke, S.J., applies himself to the question, "Are the miracles of Lourdes worthy of credit?" Happily the writer maintains that no one ought to be condemned as a heretic, if he ventures to call these alleged miracles "a pack of rubbish." He queries, however, whether a man can do so "without refusing to accept evi-

dence so clear, so well-established, so multiplied, so various, so conclusive of the point at issue, as to write himself down a fool if he declares the witnesses to be either dupes or impostors, and the facts they narrate either a lie or a delusion." He then proceeds to adduce three "best cases" which have happened within the last two years. He holds that "it is absolutely impossible that imagination could have brought them about, as in each case there was some organic lesion, or else some clearly marked physical malady, affecting and destroying the bodily tissues, and almost incurable, even after long years, by any human means."

As we hold with Huxley that it is unphilosophical to deny alleged facts simply on the ground of their occurrence being "impossible," it is with us a simple question of evidence, but we are met on the threshold of the inquiry with the difficulty of obtaining such evidence as alone can be admitted in cases where the results are opposed to our ordinary experience. Thus in the first case adduced, that of a Mdlle Phillippe, who was attacked with left-sided paralysis in 1877, and had two "cancerous swellings" in her throat in the following year, which were removed by operation. We have hardly accepted the fact of cancer, when we learn incidentally from a physician at Montpellier that it was "probably scrofulous." Such looseness of statement justifies one in hesitating to accept the alleged facts in an unqualified manner. It is true, however, that some of these recent "cures" are quite consistent with recovery under the influence of the imagination and emotion.

The wounds are said to have been healed instantane-

ously, but the proof of this is far from satisfactory; her medical man at any rate was not present, and so far as his evidence goes, the length of time may have been much longer.

In most instances, the true explanation is to be found—putting cases of downright imposture aside—in the double solution of “false facts” and the true influence of the Mind upon the Body. I do not, however, press these occurrences into my service as proofs of the latter, though to the extent indicated I believe them to be illustrations. As I call in question the accuracy of certain alleged facts on the ground that more evidence is required to substantiate that which is *primâ facie* highly improbable, it is certainly open to those who disbelieve not only in miracles but in the influence of the imagination as being so powerful, to doubt the facts to a still greater extent, and dispute their trustworthiness for even the humbler purpose to which I think they may be devoted. All I can say is that the proof of the influence of the Mind upon the Body rests upon far stronger evidence than that derived from the alleged miraculous cures of Lourdes or Knock; and that we are more than justified in applying such evidence to the elucidation of any case which appears to be fairly analogous.

In the case of Mdlle Philippe, the paralysis may have been, and we do not doubt it was, purely hysterical, and the return of power under the mental influence to which she was subjected was in accordance with the experience of every physician familiar with this disorder. No attempt is made to prove that it was not hysterical, and the burden of proof clearly lies with those who desire

to prove that her recovery was not the effect of psychical excitement.

In the second case, M^{de} André was attacked in 1879 with left-sided paralysis, and amblyopia and deafness on the same side, and was relieved by her pilgrimage to Lourdes, crying out all at once when in front of the grotto, "Sister Pauline, my fingers are moving!" In this instance there is absolutely no evidence of anything more than the hysterical hemi-anæsthesia so familiar to those who have visited the wards of the Salpêtrière. * The holy water had certainly nothing to do with the cure, for she was not plunged in the sacred spring, the profound impression produced upon her by the grotto and its associations being sufficient to produce the desired effect.

The last case is one of white tumour of the knee complicated with fistulous ulcers, ankylosis, and curvature of the leg. On the 13th of August he went to Lourdes; on the 3rd of September he walked without the aid of crutches which before were indispensable. In this instance then, it is not pretended that the cure was sudden. One is tempted to say *mutatis mutandis*, what Mr Clarke says of the cure, in the first instance, of M^{de} André's arm. "But if the arm is healed, why not the leg also?" "But if a limb is miraculously cured at all, why is it not cured at once?" Besides we know nothing of M. Leys, whose medical certificate is adduced in proof that he had attended the patient for the swelled knee. Could not the proprietor of the vaunted remedy, advertised as a "miraculous cure for corns," produce as reliable a witness?*

* The reader is referred to the new edition of Dr Wilks's

In the "Life and Letters" of an excellent man, the late Rev. Frederick Wilfred Faber (Letter xciii), we read the following which could easily be paralleled, by similar cases of relief from sick headache, by very mundane causes.

"I hardly know where to begin. Some time ago, a lady at prayer in our church thought it was revealed to her that St Mary Magdelene of Pazzi wished to confer some *grazia* on me in connection with my headache. Her director gave her permission to act upon this, whereupon she wrote to me, begging me when my headache came on, to apply a relic of the Saint to my forehead. Some days elapsed. I asked Father Francis, my director, for his leave to do this; as it was a merely temporal thing, he took some time to consider. I became ill and had a night of great pain. I thought he had forgotten all about it, and that it would be a blameworthy imperfection in me to remind him of it. The morning after, he came to confession and found me ill in bed; he was going away but I knew he was going to say mass, and so I made him kneel down by my bedside, while I put on my stole, and with considerable pain heard his confession; when he rose I gave him the stole and asked him to hear my confession, which he did. Afterwards he said, "Well now, I think it would be well to try this relic." I answered, "Just as you please." I was in great suffering, and very sick besides. He gave it me and walked away to the door to say mass. I applied the relic, a piece of her linen, to my forehead. A sort of

'Diseases of the Nervous System' (1883), for an important reference to a case, formerly under Dr Wilks's care at Guy's Hospital, alleged to have been cured at Lourdes.

fire went into my head, through every limb down to my feet, causing me to tremble ; before Father Francis could even reach the door, I sprang up, crying, "I am cured, I am quite well!" He said I looked "as white as a sheet." I was filled with a kind of sacred fear, and an intense desire to consecrate myself utterly to God. I got up and dressed, without any difficulty, or pain, or sickness. This was on the Wednesday. On the Saturday I had another headache, but I had not asked Father Francis's leave about the relic, and felt I ought to take no steps to get rid of my cross. In the afternoon he told me I might apply it. Fathers Philip and Edward were in the room. I was on my bed, I took the relic and applied it ; there was the same fire in a less degree, but no cure. I then said to the Saint, "I only ask it to go to the Novena and Benediction." The cure was instantaneous, while Father Philip had such an impression that the saint was in the room, that he was irresistably drawn to bow to her. Well, I said all my office, then in an hour or so came the Novena and Benediction, and as soon as I returned to my room I was taken so ill again I was obliged to go to bed. Meanwhile I had totally forgotten what the others reminded me of afterwards, that two years ago Michael Watts Russell wrote to me from Florence, and said ; "The children send their love and desire me to say they have just come from the Tomb of St Mary Magdelene of Pazzi, whom they have been asking to cure Father Wilfred's headache."

Nearer home than Lourdes have there been manifestations of an extraordinary character followed by alleged miraculous cures which call for some notice here. In

the summer of 1879 an apparition of the Virgin was seen at Knock, near Claremorris, in the West of Ireland, and this place subsequently became the resort of numberless pilgrims in quest of health, who found in the whitewash or cement of the walls of the church where the vision was seen the means of rapidly removing various disorders, as paralysis, rheumatism, sciatica and heart disease. The effect was heightened and sustained by the repetition of the miraculous appearances from time to time. The correspondent of the *Cork Examiner* (Sept. 17th, 1881) in describing his visit to Knock writes ; " We had heard so much of the cures accompanied at this shrine, that to hear of them from the true source, from the Curé himself, was the resolve we had made, and to his lowly residence we turned his steps, we found him seated at a table, reading his office by the light of a small lamp. He told of several cures, some of which we subjoin. He has received in the case of one cure three medical certificates. W. J. Holland was suffering from curvature of the spine, and had to wear a plaster jacket ; he was cured when he came to Knock, and soon after threw off his jacket, which weighed fifteen pounds, and walked twenty miles. George Crallene was cured of hip disease, and after his cure, entered the Diocesan College of his county and is now on his way to Rome to complete his studies for the priesthood. Father Kavanagh has seen the figure of the Blessed Virgin on two or three occasions ; he has heard her speak, and frequently has seen the most brilliant radiances surpassing anything in nature, resplendent and dazzling, whiter than fuller's earth. Together with these wonderful appearances, is the cure

of the tumour of the niece of the present Bishop of Limerick, which was pronounced incurable by a most eminent physician. She made a Novena to our Lady of Knock, using the cement sent to her by a friend. It is no exaggeration to say that hundreds have been cured in visiting Knock, and hundreds have been cured who could not take the journey, by using the cement and invoking the pity of the Mother of God."

Dr John Campbell Quinn, of Belfast, writes respecting a girl of 16, hardly able to walk, suffering from scrofulous abscesses around the hip-joint, which had been discharging for some years. She went to Knock. Three weeks after her return when seen by the doctor "the change in her condition was surprising. She had become healthy and pleasant looking, with red lips and full pulse, and the discharge had stopped. I have seen her three or four times since and each time her condition is better; only the cicatrices remain. To-day (Aug. 3, 1880) I pronounce her well and fit for work. I am forced to the conclusion, though sceptical about miracles, that the all powerful intercession of the blessed Virgin has operated upon Elizabeth Duffy in a wondrous cure, while at Knock." It is unfortunate that the wounds had not been probed by Dr Quinn, so that although he regarded the case as one of necrosis, proof is wanting. Nothing would be gained for our present purpose by multiplying these alleged cures; we know too little of the witnesses, patients, and the diseases under which they laboured to render it possible to make a scientific use of them. No doubt, however, many received benefit from visiting Knock, and left there sticks and crutches which they no

longer needed, but this is only the old story of curing disease by powerfully stimulating the recuperative powers of the system by emotional excitement, and it would be necessary to know the exact nature of the complaint on competent authority before deciding that in any particular instance the principles applicable to apparently parallel instances do not sufficiently explain its removal by the cement cure.

It is of interest to note the most recent reports of this singular modern phase of so-called miraculous healing in Ireland. The correspondent of 'The Daily News,' who visited the spot in February, 1880 and in 1881, writes to the same paper in August, 1883, that on his arrival at Claremorris he found no difficulty in obtaining a car to drive him to Knock at a very moderate fare, although the number of cars is not one third of what they were when the excitement was at its height. That the attractions of Knock are no longer what they were three or four years ago admits, the correspondent says, of no question. His description of what he saw and heard is, however, worth transcribing.

"It was near six o'clock in the evening when I reached what used to be called the little Chapel of Knock, but what is now rather an extensive edifice, capable of seating, if there were seats, probably about 600 or 700 persons. At my last visit alterations were in progress, the entire extent of which was not then indicated. Not only has the outside of the chapel been replastered—care being taken to guard by a railing the plaster of the wall on which the original apparition was said to have appeared, and the old plaster of which had been removed by the pilgrims

—but the nave of the chapel has been enlarged to nearly three times its former size by the throwing down of the side walls and rebuilding them flush with the gables of the transept ; handsome pillars springing from the site of the old walls support the roof ; the ceiling is now of polished oak, the walls are newly painted, and a handsome wooden floor has taken the place of the cold earthen one, on which, in the earlier period of the rush to Knock, the visitors had to kneel while engaged in their devotions—many of them so spending the whole night in the chapel. The rude altar, similar to those in the chapels in many remote districts in Ireland, has given place to one which for its artistic design and its admirable execution, is surpassed by few of the altars even in the Roman Catholic cathedrals.

There were only two or three people to be seen in the chapel yard at the time of my arrival. These were women of the peasant class, who knelt on the ground in front of the image of the Virgin, which has been erected within the railing already referred to. The number of crutches and sticks, all presumably discarded by people who have been cured, has largely increased since my last visit. The more remarkable of these, about 150 in number, are hung in three rows along the wall, on which the first apparition was reported to have been seen. They include crutches of all forms and of all lengths, boots for deformed feet, and all the various iron and other appliances that are used to assist lame people in walking. The crutches have all been dipped in a solution of lime, so as to give them the same colour as the newly plastered wall upon which they are hung. From an artistic point of

my arrival I was informed an apparition of the Virgin had been witnessed. The statement, it appeared, was vouched for principally by a Mrs Mullin, from Francis Street, Dublin, and some members of her family, who are what may be called permanent residents of Knock, and who having come here at an early period have remained, and now earn their living by the sale of articles of devotion in one of the tents, or rather wooden huts, devoted to that purpose, which have been erected in the chapel yard, about one-half of which, it may here be stated, are now closed, presumably because of the slackness of trade. 'Some also,' said my informant, 'saw stars, but,' she continued, 'others who were present could not see either the one or the other. I could not,' she added, 'but perhaps it was because I am not good enough ; I can't tell.'"

The resemblance of the phenomena here described to those occurring in other epidemics of emotional healing is striking, and does not increase the disposition to place the "Knock miracles" on a higher level than that to which the history of the triumphs of the imagination in its influence upon the body would lead us to refer them.

There is a very interesting passage in an old author recognising in the clearest manner and far in advance of his age the *rôle* of the imagination in the cures attributed to the sacred charm of relics. The writer is Pierre Pomponazzi, of Mantua, who flourished in the sixteenth century. After remarking "one can easily conceive the marvellous effects which confidence and the imagination can produce, especially when they exist both in the operator and the persons operated upon," he continues, "the cures attributed to certain relics are the result of

this confident imagination. Imposters and philosophers alike know that if any other skeleton were substituted for the bones of a saint, the patients would not the less be restored to health as they *believe* they approached the true relics." (Annales, p. 632, 1860.) Alas, for the slow advance of correct ideas on the subtle and marvellous power of the imagination since the days of Pomponazzi!

SECTION III.—Influence of Mental States upon Disorders involving the Involuntary Muscles and the Organic Functions

We have already seen the influence of the Imagination, &c., upon the involuntary muscles (especially the muscular fibre of the intestinal canal), and will only add here three cases; two showing the action of mental states on constipation, and the other on asthma—probably spasmodic. In the illustrations given, however, of other diseases, this action on the muscular coat of the vessels is, to a large extent, exemplified.

Constipation.—In the 'Bibliothèque choisie de Médecine,' tome vi, p. 84, is a good example of the effect produced by the Imagination, during sleep, upon the action of the intestines. The daughter of the Hanoverian Consul, aged 18, having to take a rhubarb purge on the following day, which she especially disliked, dreamed that she had taken the hated dose. Gripped by her imaginary rhubarb she awoke, and the bowels acted freely five or six times. Precisely similar is a case which I give on the same authority (Demangeon); that of a monk for whom some purgative had been prepared, to

be taken on the following day. He dreamed that he swallowed the medicine, the consequence of which was that he was aroused by the necessity of attending to the calls of nature, and was copiously purged eight times (lx, p. 149). All must admit that any medical man who would engage to ensure the same operations from imaginary as from real rhubarb or senna, would enjoy a fashionable purgative practice.

Asthma.—Dr Moore gives the following : “ An officer in the Indian army was confined to his bed by asthma, and could only breathe in an erect posture ; but a party of Mahrattas broke into the camp, and fearing certain death, he sprang out with amazing activity, mounted his horse, and used his sword with great execution, although the day before he could not draw it from its scabbard ” (xxxviii, p. 309).

Warts.—The influence of the Imagination upon warts, trivial as it seems, is really a curious page in the history of this power as a curative agent. They are so apparent that there cannot be much room for mistake as to whether they have or have not disappeared, and in some instances within my own knowledge, their disappearance was in such close connection with the physical treatment adopted that I could hardly suppose the cure was only *post hoc*. In one case, a relative of mine had a troublesome wart on the hand, for which I made use of the usual local remedies but without effect. After they were discontinued, it remained *in statu quo* for some time, when a gentleman “ charmed ” it away in a few days. A surgeon informs me that some years ago his daughter had about a dozen warts on her hands. They had been there about eighteen

months, and her father had applied caustic and other remedies without success. One day a gentlemen called, and in shaking hands with Miss C—, remarked upon her disfigured hand. He asked her how many she had ; she replied she did not know, but thought about a dozen. "Count them, will you ?" said the caller, and taking out a piece of paper he solemnly took down her counting, remarking, "You will not be troubled with your warts after next Sunday." Now, it is a fact that by the day named, the warts had disappeared and did not return.

Brand (op. cit.), points out that warts were cured by magic in Lucian's time ; and he refers to a time-honoured cure for warts, that of stealing a piece of beef from a butcher's shop, rubbing your warts with it, then throwing it away or burying it. As the beef rots the warts decay. I daresay that the excitement of the theft was one element in the cure.

In visiting a County Asylum some years ago my attention was directed to several of the patients and nurses who were pestered with warts, and I solemnly charmed them away within a specified period. I had quite forgotten the circumstance until on revisiting the institution a few months afterwards, I found that my practice had been followed by the desired effect, and that I was regarded as a real benefactor.

As Dr Carpenter says, therefore, "the charming away of warts by spells of the most vulgar kind" belong to those "cases which are *real facts*, however they may be explained" (viii, p. 984).

Lord Bacon, in his 'Natural History,' does not fail to refer to the curing of warts by charms, and adduces his

own experience, but does not see through the charm the effects of the Imagination. "I had from my childhood," he says, "a wart upon one of my fingers; afterwards, when I was about sixteen years old, being then at Paris, there grew upon both my hands a number of warts, at the least a hundred, in a month's space. The English Ambassador's lady, who was a woman far from superstition, told me one day she would help me away with my warts; whereupon she got a piece of lard with the skin on, and rubbed the warts all over with the fat side; and amongst the rest, that wart which I had from my childhood; then she nailed the piece of lard, with the fat towards the sun, upon a post of her chamber window, which was to the south. The success was that within five weeks' space all the warts went away, and that wart which I had so long endured for company. But at the rest I did little marvel, because they came in a short time, and might go away in a short time again; but the going away of that which had stayed so long doth yet stick with me" (xiv, ii, p. 73).

Bacon attributes this result, not to the expectant action of the mind upon the warts, but to the sympathy supposed to exist between the lard and the warts after they had once been in contact. The lard having touched the warts, the melting or wasting away of the former in the sun, caused the disappearance of the latter. The exploding of this vulgar error is one of the triumphs of the inductive process of investigation which Bacon himself initiated.

"Even tumours," says Hunter, "have yielded to the stroke of a dead man's hand" (ii, I, p. 360). A curious illustration of this superstition is given in Brand's 'Popular Antiquities' (vol. iii, p. 147), from a newspaper

published in 1777. "After Dr Dodd had hung about ten minutes, a very decently dressed young woman went up to the gallows in order to have *a wen* on her face stroked by the doctor's hand; it being a received opinion among the vulgar that it is a certain cure for such a disorder. The executioner, having untied the doctor's hands, stroked the part affected several times therewith." Unfortunately we are not told whether the application was successful.

Scurvy.—That nervous diseases are not alone influenced by the Imagination or Expectation, is well shown by the effect produced upon blood diseases. Scurvy, as has been often stated, was cured solely by this means at the Siege of Breda in 1625. The Prince of Orange, when the city was almost obliged to capitulate, sent word to the sufferers that they should soon be relieved, and provided them with medicines pronounced to be very efficacious in the cure of scurvy. "Three small phials of medicine were given to each physician, not enough for the recovery of two patients. It was publicly given out that three or four drops were sufficient to impart a healing virtue to a gallon of liquor." "We now displayed our wonder working balsams," continues the narrator, Dr Frederic Van der Mye; "nor were even the commanders let into the secret of the cheat put upon the soldiers. They flocked in crowds about us; every one soliciting that part might be reserved for their use. Cheerfulness again appears in every countenance, and a faith prevails in the sovereign virtues of the remedy. . . . The effect of the delusion was really astonishing; for many quickly and perfectly recovered. Such as had

not moved their limbs for a month before, were seen walking the streets sound, upright, and in perfect health. They boasted of their cure by the Prince's remedy. . . . Many who declared that they had been rendered worse by all former remedies, recovered in a few days to their inexpressible joy, and the no less general surprise, by taking (almost by their having brought to them) what we affirmed to be *their gracious Prince's cure*" (Dr Lind, 'On the Scurvy,' p. 352). Before this happy experiment was tried they were, states Van der Mye (who was present), in a condition of absolute despair. "This, the terriblest circumstance of all, gave rise to a variety of misery; hence proceeded fluxes, dropsies, and every species of distress (*omne chaos morborum*), attended with a great mortality."

It is stated on good authority that in 1744, the prospect of a naval engagement between the British and Allied fleet had the effect of checking the scurvy (lxi, i, p. 129).

Such a result of the Imagination as the above shows, as we have said, that its operation is not restricted to affections of the nervous system. John Hunter observes that, while we should naturally expect that diseases connected with the nerves—and those in which their alteration is in the action of parts, not in their structure—would be most affected by the Imagination, "we find that there are other diseases with which they appear to have little connection that are much affected by the state of the mind" (ii, i, p. 360).

Gout.—"You may see a person with gout, says Abernethy in his Lectures, "who is almost unable to move

with pain ; but produce a shock on his nervous system by telling him that the house is on fire, and he will scamper about like a lamplighter. As Smollet tells us, in one of his novels, of Captain Lismahago, who went into a house and cried out to an old gentleman with the gout, 'Mad dog ! mad dog !' when he jumped up and ran out of the house even into a pond of water opposite." In such examples it is immaterial whether the terror arise from a real or an imaginary cause ; the remarkable, though familiar fact is, that a strong mental image or impression infuses new power into the nervous and muscular system. The very fear which in a healthy person may produce excessive muscular contraction—a convulsion—will serve to nerve the limb of the crippled podagric just sufficiently to enable him to escape from danger. But were this all, we could not adduce this occurrence as an illustration of the *cure* of the gout ; an obstacle to locomotion being temporarily overcome, but the disease remaining. In the second case, however, adduced in the following illustrations, an actual cure would appear to have been effected.

"A captain of a British ship of war," says Dr Rush, "who had been confined for several weeks to his cabin by a severe fit of the gout in his feet, was suddenly cured by hearing the cry of 'Fire' on board his ship. This fact was communicated to me by a gentleman who was a witness of it. Many similar cases are upon record in books of medicine. I shall in another place insert an account of one in which the cure effected by a fright *eradicated the disease from the system so completely as ever afterwards to prevent its return.*" Here is the

case, communicated by Judge Rush the doctor's brother :—

“ Peter Fether, the person cured, is now alive, a householder in Reading, seventy-three years of age, a native of Germany, and a very hearty man. The first fit of the gout he ever had was about the year 1773; and from that time till 1785 he had a regular attack in the spring of every year. His feet, hands, and elbows were much swollen and inflamed; the fits lasted long and were excruciating. In particular the last fit in 1785 was so severe as to induce an apprehension that it would inevitably carry him off, when he was suddenly relieved by the following accident. As he lay in a small back room adjoining the yard, it happened that one of his sons, in turning a waggon and horses, drove the tongue of the waggon with such force against the window, near which the old man lay stretched on a bed, as to beat in the sash of the window and to scatter the pieces of broken glass all about him. To such a degree was he alarmed by the noise and violence, that he instantly leaped out of bed, forgot that he had ever used crutches, and eagerly inquired what was the matter. His wife, hearing the uproar, ran into the room, where, to her astonishment, she found her husband on his feet, bawling against the author of the mischief with the most passionate vehemence. From *that* moment he has been *entirely exempt from the gout*, has never had the slightest touch of it, and now enjoys perfect health, has a good appetite, and says he was never heartier in his life. . . . To you, who have been long accustomed to explore diseases, I leave the task of developing the principles on which this mys-

terious restoration from the lowest decrepitude and bodily wretchedness to a state of perfect health, has been accomplished. I well know that toothaches, headaches, hiccoughs, &c., are often removed by the sudden impression of Fear, and that they return again. But to see a debilitated gouty frame instantly restored to vigour; to see the whole system in a moment, as it were, undergo a perfect and entire change, and the most inveterate and incurable disease *radically* expelled, is surely a different thing, and must be acknowledged a very singular and marvellous event. If an old man languishing under disease and infirmity had *died* of mere fright, nobody would have been surprised at it; but that he should be absolutely cured, and his constitution renovated by it, is a most extraordinary fact, which, while I am compelled to believe by unexceptionable evidence, I am totally at a loss to account for" (lxi, ii, p. 180).

Probably no one will be disposed to question the genuineness of this case; but it is often easier to believe a thing has happened, than that it will happen again. I once called upon a physician whom I found powerless on the couch from an attack of gout. He said he "had been howling with pain for the last twenty-four hours." I ventured to tell him that I had no doubt he would be able to run down stairs into the street if the house were on fire, or a tiger from a menagerie in the neighbourhood should enter the room. He at once replied that, although such an event might cure a *nervous* or *hysterical* disease, it would never cure *gout*. I mentioned several cases in point. He denied the facts, and asserted that no power on earth could possibly make *him* move. Unfortunately

(for science), neither fire nor tiger tested the correctness of his opinion ; but as he was out again in a couple of days, there is nothing improbable in the view that, by a mental shock, he might have been as suddenly cured as Peter Fether, whose case was chronic and much more severe.

Phthisis.—Terror has appeared to benefit even patients in consumption. According to Dr Blane a frightful hurricane in Barbadoes in 1780 had one salutary effect—that of benefiting some and curing others who laboured under tubercular disease of the lungs. Of course in the absence of more detailed evidence, especially that obtained from the stethoscope, such a statement must not be taken for more than it is worth. Dr Rush refers to the cases related by Van Swieten and Smollett of consumptive patients recovering their health from falling into cold water, and inclines to think that in both instances fright and consequent exertion produced a beneficial result—observing that this is only one of many proofs which might be brought forward, of partial or unequal action being suddenly changed into general and equal excitement throughout the system. The passions excited by war are regarded by him as explaining some of the cases of phthisis which are said to have occurred in camp life (lxi, ii, p. 83).

Tissot records the following :—A man of letters reached an advanced stage of phthisis, when he consulted a physician. At this period he happened to obtain fresh literary distinction, and was fortunate in other ways ; the consequence being that he was greatly delighted. The physical effect was that his pulmonary affection was

suspended and remained stationary for a long time (xxxv, Sept., 1867, p. 167).

The same writer cites from Mead the case of a young woman, aged 28, who laboured under all the symptoms of confirmed phthisis, and was threatened with death, when exaggerated fear about the state of her soul, began to torment her. Alarm, increased by the discourse and exhortations of friends, no doubt more pious than enlightened, threw her into a state of religious insanity. The consequence, as respects the bodily condition, was that the hectic fever, the expectoration, the sweats, the emaciation and other unfavorable symptoms disappeared, and led to the hope of cure. But the form of the mental affection having changed to simple melancholy, the hectic returned, the pulmonary disease progressed, and the patient died in the last stage of consumption (op. cit.).

Dropsy.—Fear may be regarded as the digitalis of our Remedia Psychica. By influencing the tone of the vital powers it may act upon the circulation and the absorbents rapidly and effectually. Abernethy's case of the poor woman frightened by a bull, and relieved of her burden, will occur to the reader. Here the relief came through the kidneys. It has been supposed that the fear of death (as well as the fasting he adopted) served to relieve Dr Johnson of twenty pints of fluid, as recorded by Sir John Hawkins.

Dr John Pennington, of Edinburgh, records the following: "A sailor in an ascites, fell off the end of the yard into the sea; the weather being calm he was taken up unhurt, but to use the sailor's words, who told me the story, he was frightened half to death, and as soon as he

was taken out of the water, he discharged a gallon of urine or more." Dr Pennington observes, "the sedative operation of Fear, was, no doubt, the cause of the cure."

Dr Rush refers to the case of a young woman (19 years of age) who had taken the usual remedies for ascites without any benefit. Dr Hull was consulted and immediately proposed that the operation of tapping should be performed. "To this she objected, but so great was the fear of this operation, which the proposal of it suddenly excited in her mind, that it brought on a plentiful discharge of urine, which in a few days perfectly removed her disease." Again, a lady with dropsy in Philadelphia was informed that tapping was necessary, and was much terrified upon hearing it. "I saw her two days afterwards when she told me, with a smile on her countenance, that she hoped she should get well without tapping, for that she had discharged two quarts of water, in the course of the day after we had advised her to submit to that operation. For many days before she had not discharged more than two or three gills in twenty-four hours" (lxi, ii, p. 114). However, in this case the operation was subsequently performed. On the occasion of a second paracentesis, Fear again appeared to be the cause of a remarkable stimulation of the kidneys. Two similar cases fell under the observation of this physician. We have in a previous chapter (ii, p. 109) reported an interesting case of this kind, in order to illustrate the influence of emotional excitement on the organic functions. In this and several other instances, the illustrations which we gave for this purpose were necessarily examples also of the cure of disease.

Intermittent Fever.—A chapter might be written simply on the charms supposed to be of efficacy in ague. One remedy was wearing round the neck the mysterious word “Abracadabra,” written in a peculiar manner. Chips from the gallows, placed in a bag and hung round the neck, or put on the skin, “will cure the ague, or prevent it,” says Grose. The same result was expected from the halter of a criminal who had been executed.

In Brand’s ‘Popular Antiquities’ (vol. iii, p. 149) from which the above is taken, occurs the following: “Mr Douce’s MS. notes says, ‘It is usual with many persons about Exeter who are affected with ague, to visit at dead of night the nearest cross road five different times, and there bury a new laid egg. The visit is paid about an hour before the cold fit is expected; and they are persuaded that with the egg they shall bury the ague.’ I shall here note another remedy against the ague mentioned as above, viz., by breaking a salted cake of bran, and giving it to a dog when the fit comes on, by which means they suppose the malady to be transferred from them to the animal.”

“Amulets,” says Adams, in his charming and learned commentary on Paulus Ægineta, “were very much used in ancient times for the cure of quartans. Alexander Traillian had great confidence in them. Galen supposed that they owed their virtues to the physical properties of the substances which were appended” (vol. i, p. 248).

It is stated that the ague was very successfully cured by Faith, on a large scale, by Ferrarius. In the course of a twelvemonth he cut the disease short in about fifty persons solely by slips of paper, on which he inscribed

the word "febrifuge," and gave them to the patients with the instruction that they should cut off a letter every day. A Spanish lieutenant recovered by the time he arrived at the sixth letter (xxxvi, 1850, p. 161). John Hunter says, "agues have been cured by charms, which I have seen been used with a thorough conviction of their being a sovereign remedy. I am apt to suppose that a spider web, when taken for an ague, cures in the same way at least in one case, for on giving it without the patient's knowledge it had not the slightest effect, but by persuading the patient that it was a spider, the effect was produced at least the disease did not return" (ii, i, p. 360).

Intoxication.—Among the remedies for drunkenness Rush (lxi, ii) enumerates Terror, and gives in illustration the story of some young merchants who got drunk in a cabin on James's river, and were carried away by the sudden rise of the river in consequence of a heavy fall of rain. In great danger and, no doubt, fear they floated in the current for several miles. "When they reached the shore that saved their lives, they were all sober" (171). Another remedy he mentions is the excitement of a fit of Anger, and relates, on the authority of Witherspoon, the history of a man in Scotland, who was always cured of a fit of drunkenness by being made angry. The way to make him angry was, not to argue against the sin of drunkenness, but against *religion*.

In connection with psychical cures for a state of acute drunkenness may be mentioned a psychical antidote to intemperate habits from the same author, the emotion in this case being "Resentment," but it would be not correct to say that it exhibits the power of the Will

the thirst for drink. A citizen of Philadelphia had made many unsuccessful attempts to cure his wife of drunkenness. At length, despairing of her reformation, he purchased a hogshead of rum, and after tapping it, left the key in the door of the room in which it was placed, as if he had forgotten it. This design was to give his wife an opportunity of drinking herself to death. She suspected this to be his motive, in what he had done, and suddenly left off drinking" (p. 175).

A drunkard may be cured of his vice by the association of ideas. Immediately after drinking some spirits a gentleman became the subject of a painful attack of rheumatism. The attack was due to exposure to wet, but he associated it with the toddy he had taken, and from that time did not cease to loathe that liquor. Whenever he thought of it, his Imagination pictured the accompanying sensation of suffering in his joints; his revulsion being automatic rather than dependent on any process of reasoning. As Dr Rush points out, Moses availed himself of this principle of our mental constitution when he made the Israelites drink the nauseous and bitter solution of the Golden Calf, by associating which, ever after, with the sin of idolatry, they were likely to hold it in detestation.

The influence of the state of the mind in modifying the ordinary action of intoxicating drinks upon the system, is shown by the circumstance that if the attention or feelings are absorbed in any matter of interest, a much larger amount can be imbibed without producing an effect on sensation and motion, than would otherwise be the case.

Threatened Death.—When treating of the influence of psychical agents upon the body in causing disease, we found them sufficiently powerful to cause death itself. Conversely, there is ample evidence to show that, while the dead cannot be restored to life, the patient threatened with death may recover through the instrumentality of mental impressions. It is not necessary to dwell upon the salutary influence exerted by any circumstance which happens to excite the emotions of Hope and Joy in the sick-room; or the beneficial influence of satisfactorily settling affairs of business, &c. “I have known many recoveries from imminent danger,” observes Dr Badeley, “by the relief which the mind experienced after making a will; and most of that danger might have been prevented by having made it when in health.”

I have now sufficiently illustrated the remarkable influence exerted by mental states, as Imagination, Expectation, Faith, Hope, and Joy, in curing disease. To these cases might have been added a large number which I have collected together, in which the same influence was present, and was, in all probability, the operative cause, which I have rejected because they might be objected to, inasmuch as certain agencies were employed, to the power of which the cures were, and still are, by many persons, attributed. Those who have visited the continental churches will remember the large number of crutches, sticks, splints, &c., which have been left there by those who have (there is no reason to doubt), been cured or relieved of contracted joints, rheumatism, and palsy, by prayers offered up to some saint, or by the supposed efficacy of their relics. Although I have no doubt

that the influence of Imagination and Faith sufficiently explains the success of the method adopted in these cases, I exclude them as evidence for the reason above stated. So with the cures performed by Prince Hohenlohe,* as the Roman Catholic might attribute them to supernatural agency transmitted through a Priest; as the modern spiritualist† maintains that he was a Medium; and as the Animal Magnetist claims them as the result of a magnetic influence passing from the princely healer to the patient, I shall not adduce them as illustrations of the action of the Mind upon the Body in the cure of disease. The letter written by a Prince of the Blood—the ex-King of Bavaria—to the Count von Sinsheim, describing his own case, is, however, too curious to be omitted here:—

* His name and titles had probably much to do with his influence. They were Alexander Leopold Franz Emmerich, Prince of Hohenlohe-Waldenburg-Schillingsfürst, Archbishop and Grand Provost of Grosswardein, Hungary, and Abbot of St. Michael's at Gaborjan. Born 1794, in Waldenburg; educated in several Universities; he officiated as Priest at Olmütz, Munich, &c. When twenty-six he met with a peasant who had performed several astonishing cures, and from him caught the enthusiasm which he subsequently manifested in healing the sick. He constantly appealed to their faith in his power.

† See in the 'Spiritualist Magazine,' Nov., 1867, an article by William Howitt, from which the particulars given in the text are taken. In regard to Spiritualism, we would pursue the same course as in Animal Magnetism (see p. 5), not say that the alleged phenomena are impossible *because* the Imagination, &c., can work wonders, but simply confine ourselves, for our present object, to the collection of cases which certainly are the result of psycho-physical influences. If the spiritualistic cases of healing are not more wonderful, then clearly we are not justified in calling in another principle to explain them. If they are, by all means utilise them.

My dear Count,

There are still miracles. The ten last days of the last month, the people of Würzburg might believe themselves in the times of the Apostles. The deaf heard, the blind saw, the lame freely walked, not by the aid of art, but by a few short prayers, and by the invocation of the name of Jesus. . . . On the evening of the 28th, the number of persons cured, of both sexes, and of every age, amounted to more than twenty. These were of all classes of the people from the humblest to a prince of the blood, who, without any exterior means, recovered, on the 27th at noon, the hearing which he had lost from his infancy. This cure was effected by a prayer made for him during some minutes, by a priest who is scarcely more than 27 years of age—the Prince Hohenlohe. Although I do not hear so well as the majority of the persons who are about me, there is no comparison between my actual state and that which it was before. Besides, I perceive daily that I hear more clearly. . . . My hearing, at present, is very sensitive. Last Friday, the music of the troop which defiled in the square in the front of the palace, struck my tympanum so strongly, that for the first time, I was obliged to close the window of my cabinet. The inhabitants of Würzburg have testified, by the most lively and sincere acclamations, the pleasure which my cure has given them. You are at liberty to communicate my letter, and to allow any one who wishes, to take a copy of it.

Louis, Prince Royal.

Bruckenaus; July 3rd, 1822.

So, likewise, Professor Onymus, of the University of Würzburg, reporting on the cases cured by Prince

Hohenlohe which he himself witnessed, gives the following:—

“Captain Ruthlein, an old gentleman of Thundorf, 70 years of age, who had long been pronounced incurable of paralysis, which kept his hand clenched, and who had not left his room for many years, has been perfectly cured. Eight days after his cure he paid me a visit, rejoicing in the happiness of being able to walk freely.

“A man, of about 50, named Bramdel, caused himself to be carried by six men from Carlstadt to the Court at Stauffenburg. His arms and legs were utterly paralysed, hanging like those of a dead man, and his face was of a corpse-like pallor. On the prayer of the Prince he was instantly cured, rose to his feet, and walked perfectly, to the profound astonishment of all present.

“A student of Burglauer, near Murmurstadt, had lost for two years the use of his legs; he was brought in a carriage, and though he was only partially relieved by a first and second prayer of the Prince, at the third he found himself perfectly well.

“These cures are real, and they are permanent. If anyone would excite doubts of the genuineness of the cases operated by Prince Hohenlohe, it is only necessary to come hither and consult a thousand other eye and ear witnesses like myself. Everyone is ready to give all possible information about them.”

Father Mathew, in our own day, if not so successful as Prince Hohenlohe, relieved a large number of persons, and on exactly the same principle. The reason which induced us not to employ the Prince's cures in evidence applies therefore equally to his. Let us, however, assume

for a moment that in both cases their prayers, as affirmed by themselves and their adherents, were the cause of their remarkable success. The difficulty at once arises that in Father Mathew's case, the same diseases which he had cured during his lifetime, were just as effectively relieved after his death, by visiting the good Father's tomb, in the firm faith that a miracle would be performed. The readers of his Life know that many a cripple left his crutch there. In such instances, the analysis of the agencies possibly at work is rendered much easier from the absence of several to which some would assign, in other instances, a therapeutic virtue. No living body, therefore no animal magnetism. No infinitesimal doses, therefore no homœopathy. No drugs of any kind, therefore no physic. No Medium, therefore no spiritual influence of that kind. No priest, therefore no prayers over the patient.

All these being eliminated, nothing would seem to remain but the influence of expectant Faith, an influence called into powerful operation by the supposed miraculous power of the deceased, augmented doubtless by the excitement occasioned by crowds flocking, with a common sympathy, to the same spot. A woman, bedridden for years, is carried or manages to crawl there, the deepest emotions are stirred—hope, longing, belief—and she finds a new power in her system ; an impetus is conveyed to the limbs, and she walks home with ease. Her cure kindles the faith of others, and it is not unlikely that the combined influence of her sudden recovery of the use of her limbs, and the imaginary virtues of the tomb, would restore some to health, for whom the latter alone would

have been insufficient. The epidemics of cure are as definite, and admit as easily of study, as the epidemics of disease. They will also equally repay the labour bestowed upon tracing their causes, their rise and decline and their extent. Why they should decline is, perhaps, more difficult to explain than why they should arise.

Again, from the same point of view, although I do not include cases of insanity in my collection of illustrations, since they are examples of the influence of the mind upon its own organ, I may refer to the means employed till quite recently at Gheel* for the cure of the insane.

In 1862, when I visited the "City of the Simple," I saw the room where the lunatic is lodged, when the evil spirit with which he or she is possessed, is exorcised. (Here it is orthodox to regard madness as identical with possession.) Six months previously a lady had occupied it. The priest came to her every day with a relic, and performed the customary incantations. The result was

* There is a legend that in the ninth century the daughter of an Irish King (Dymphna) fled from her father's persecution on account of her having become a Christian. He followed her to Gheel, and, having discovered her retreat, beheaded her. Several lunatics who happened to witness the deed were cured on the spot. Admitting the fact, the cures at this stage of the history, may be referred to a powerful and painful emotion. The cures were, of course, regarded as miraculous, and Dymphna was duly canonized. The number who subsequently flocked to her tomb was so great that, in course of time, a colony sprung up and a sane population became accustomed to take charge of the insane in their humble cottages. I visited the Church of St. Dymphna, where her acts are recorded in oak, from the day of her birth to that of her death. Here her relics are preserved, and are still occasionally employed to minister to minds diseased.

of Royalty to disturb the inference drawn from the improvement following the latter. If it be attributed to change of scene rather than air, we might still claim the agency as psychical. Mere change of locality, as is well known, will often benefit a patient, although the change, as regards air, be a change for the worse. The remedy acts upon the body through the mind or imagination. A hospital patient has an ill-conditioned sore, and does not go on well; he is removed to another ward, and the vital action in the part may at once assume a healthy appearance. A little psychical nitrate of silver has been employed, and has stimulated the granulations more effectually than its local application previously.

In reference to the Royal Touch, there is a curious passage in Aubrey. "The curing of the King's Evil," he says, "by the touch of the king, does much puzzle our philosophers, *for whether our kings were of the house of York or Lancaster, it did the cure for the most part.*" In other words, the Imagination belongs to no party, guild, or creed.

CHAPTER XVII

PSYCHO-THERAPEUTICS

PRACTICAL APPLICATION OF THE INFLUENCE OF THE
MIND ON THE BODY TO MEDICAL PRACTICE

WE now approach the consideration of the question, How can the foregoing facts, proving, as they do, the great influence which mental states exert over the body in disease, be practically applied for therapeutic purposes? Can this unquestionable power be controlled and directed? Ought we deliberately to cause a mental shock? We have seen that gout may be cured by the patient's window being smashed by a waggon or by his house being set on fire. May we not imitate these accidents to obtain the same end?

SECTION I.—General Influence of the Physician upon the Patient in Exciting those Mental States which act beneficially upon the Body in Disease

No one disputes that the physician and the surgeon can and constantly do make use of this agent, in their mode of addressing their patients, in the hope and confi-

dence which they endeavour to inspire, and in the removal of everything calculated to depress them.

“Sunt verba et voces, quibus hunc lenire dolorem
Possis, et magnum morbi deponere partem.”

It is, however, a striking illustration of the relative degree in which psychical and physical remedies have been cultivated that in Pereira's ‘*Materia Medica*,’ which includes in its range the *Remedia Psychica*, the observations upon these remedies are compressed within three pages. While, however, he points out the difficulty of producing, regulating, and controlling psychical remedies he allows that they are by no means unimportant and ought not be neglected. He disposes of the influence of the Imagination in two lines.

Few physicians have had more practical experience of disease than the celebrated Dr Rush, and his testimony to the good effects of inspiring confidence, even in active disease, is clear and forcible. “I have,” he says, “frequently prescribed remedies of doubtful efficacy in the critical stage of acute diseases, *but never till I had worked up my patients into a confidence bordering upon certainty of their probably good effects.* The success of this measure has much oftener answered than disappointed my expectations” (lxi, i, p. 257). He attributes the cure to the vigorous concurrence of the Will with the action of the medicine.

In the ‘*Lancet*’ of December 18th, 1869, Dr John Tanner advocates the treatment of hysterical aphonia by electro-magnetism, applied to the tongue only, and states that in more than fifty cases he had applied it without

being unsuccessful in any. He reports four cases :—In the first the patient's voice returned with a loud scream ; in the second the voice at once returned ; in the third the voice returned, was lost again in about ten minutes, and was permanently restored after a repetition of the remedy ; in the fourth the voice instantly returned. In his commentary upon these cases Dr Tanner remarks, "It is all important, before you apply electro-magnetism, to convince your patient *that she will be cured* ; for if you fail in your powers of persuasion, it is probable the result of its application will not be satisfactory." This almost amounts to a confession that the application is little worth in itself, but that the cure is really effected by powerfully appealing to the Imagination and making use of means which the patient may well believe calculated to produce a decided effect.

It is certainly extraordinary that notwithstanding the acknowledged influence of mind in the action of drugs, its disturbing effect is rarely taken into account, practically, by physicians. Hence to a large extent the utterly contradictory reports made in regard to the action of new medicines ; hence the humiliating amount of fashion in the favour with which remedies are received, and then deserted to give place to others equally be-praised and equally uncertain. Among those physicians who have freely recognised this fruitful source of fallacy, Dr Wilks has spoken out most emphatically in his Lectures on the Nervous System. "The doctor," he observes, "soon finds that in treating his patient, the practice of medicine is not only one of physic, but of psychology, and that the effect of his drugs *depends as much upon the constitution of the*

patient's mind as his body. I know several persons, amongst others two notable examples in our profession, who say they cannot take physic; they mean that two or three grains of rhubarb will violently purge them, that a few drops of opium upset their livers and stomach for several days, that three grains of iodide of potassium will cause coryza and headache, and so on through the whole list of drugs. These very unpleasant people and unsatisfactory patients are counter-balanced by our old and steadfast adherents who ask for a prescription with confidence, and declare that whatever you give them does them good" (cix, p. 598).

Whether, and to what extent, the physician may avail himself of Fear in the treatment of disease, has often been discussed. It cannot be denied that, while inflicting a great deal of suffering, it has been successful in not a few instances, as in the case of the lady that was cured of the vapours by a Noble Lord, who arranged that in the midst of one of her most violent fits, four mutes dressed in white should enter her apartment, slowly approaching, and take her without violence in their arms, and without giving her time to recollect herself, convey her into a distant chamber hung with black and lighted with green tapers!! (lxxxvi, p. 26). Dr Crawford, of Baltimore, is related to have advised a patient, who fancied he was dying of liver disease, to travel. On returning he appeared to be quite well, "but upon receiving information of the death of a twin brother, who had actually died of a scirrhus liver, he immediately staggered, and falling down, cried out that he was dead; and had, as he always expected, died of a liver complaint. Dr Crawford being sent for,

immediately attended; and on being informed of the notion which had seized the hypochondriac, exclaimed 'Oh, yes, the gentleman is certainly dead, and it is more than probable his liver was the death of him. However, to ascertain the fact, I will hasten to cut him open before putrefaction takes place.' He called for a carving knife, and whetting it, as a butcher would to open a dead calf, he stepped up to him, and began to open his waistcoat. The hypochondriac became so terribly frightened, that he leaped up with the agility of a rabbit, and crying out 'Murder! murder! murder!' ran off with a speed that would have defied a score of doctors to catch him. After running a considerable distance, until he was almost exhausted, he halted; and not finding the doctor at his heels, soon became composed. From that period this gentleman *was never known to complain of his liver*; nor had he for more than twenty years afterwards, any symptoms of this disease!" (op. cit., p. 149).

Fear no doubt acts beneficially through the Will—that is to say, in presence of a greater evil, the patient resolves not to yield to the lesser one, knowing that if he does not yield, he will escape its infliction. Under this class, fall those numerous cases in which nervous symptoms—convulsions, spasms, &c.—are at once controlled by the threat of unpleasant consequences.

We cannot, however, expect that beyond the salutary awe, which in some nervous cases it may be desirable for the patient to feel for the physician, the emotion of Fear will be beneficially employed, and we fully unite with Esquirol in his remarks on its employment in epilepsy. "We reject" he says, "as dangerous the salts

of copper and nitrate of silver, how many miracles soever may be attributed to their use. We can say as much of Fear, which is recommended by some rash persons. But who can calculate the effects of Fear, and consequently, who would dare to make use of it, as a curative agent ?”

SECTION II.—Importance of arousing the Patient's Will

The power of the Will in resisting disease apart from the influence of the Imagination or the concentration of the Attention, is unquestionable. “ Oh, if I could once make a resolution, and determine to be well !” exclaimed the German physician Walderstein.

The poet Churchill said—

“ The surest road to health, say what they will,
Is never to suppose we shall be ill ;
Most of those evils we poor mortals know
From doctors and *imagination* flow.”

It is a pity, however, that we have to confess that the poet died at the early age of thirty-four (of fever). We must conclude that his dissipated life neutralised the good effects likely to result from supposing that he should not be ill.

At a *séance* of the Royal Academy of Medicine of Paris, Dr Barthélemy expressed his conviction that the symptoms of hydrophobia in man were mainly due to the imagination and irritability of the patient. In proof of this he adduced his own case. He had introduced his finger into the throat of a mad dog, and drew it out

covered with frothy saliva ; in drying it he observed that he had a slight excoriation on his finger. He lightly cauterised it, but ten days after, he experienced a sense of constriction about the throat. He felt alarmed ; the difficulty of swallowing increased until he could not drink anything, and the sight of water caused spasms. The Will, however, was strongly exercised, and at last gained the day ; the symptoms gradually abated, and in about a week he was well (lx, p. 140).

An event in the life of Andrew Crosse, the electrician, illustrates in a striking manner, the power of the Will over threatened disease, the symptoms in his case being those of hydrophobia. It would seem to illustrate the force of this influence, not only directly over the incipient irregular action of certain motor nerves and muscles, by forcing them into healthy exercise, but over the automatic action of the cerebrum itself, by resolutely arresting the train of ideas which have been excited. If "an act of the Will frequently excites such changes in the brain as to arrest an incipient paroxysm of angina pectoris or epilepsy" (Laycock) there seems no reason why it should not exert the same influence over the symptoms present in this case.

Mr Crosse was severely bitten by a cat which died the same day hydrophobic. He appears to have thought little of the circumstance, and was certainly not nervous or imaginative in regard to it. Three months, however, after he had received the wound, he felt one morning great pain in his arm, accompanied by extreme thirst. He called for a glass of water. The sequel will be best told in his own words :—"At the instant that I was

about to raise the tumbler to my lips, a strong spasm shot across my throat; immediately the terrible conviction came to my mind that I was about to fall a victim to hydrophobia, the consequence of the bite that I had received from the cat. The agony of mind I endured for one hour is indescribable; the contemplation of such a horrible death—death from hydrophobia—was almost insupportable; the torments of hell itself could not have surpassed what I suffered. The pain, which had first commenced in my hand, passed up to the elbow, and from thence to the shoulder, threatening to extend. I felt all human aid was useless, and I believed that I must die. At length I began to reflect upon my condition. I said to myself, either I shall die or I shall not; if I do, it will only be a similar fate which many have suffered, and many more must suffer, and I must bear it like a man; if, on the other hand, there is any hope of my life, my only chance is in summoning my utmost resolution, defying the attack, and exerting every effort of my mind. Accordingly, feeling that physical as well as mental exertion was necessary, I took my gun, shouldered it, and went out for the purpose of shooting, my arm aching the while intolerably. I met with no sport but *I walked the whole afternoon, exerting, at every step I went, a strong mental effort against the disease.* When I returned to the house I was decidedly better; I was able to eat some dinner, and drank water as usual. The next morning the aching pain had gone down to my elbow, the following it went down to the wrist, and the third day left me altogether. I mentioned the circumstance to Dr Kinglake, and he said he certainly considered that

I had had an attack of hydrophobia, which would possibly have proved fatal had I not struggled against it by a strong effort of mind." ('Memoirs of Andrew Crosse,' p. 125.)

In hysteria, the influence of the Will *versus* the reflex action of voluntary muscles is constantly seen. Mr Skey records the case of a young lady of sixteen, who for many months had been suffering from inversion of the left foot, which was twisted at right angles with the other, and was treated by orthopædic surgeons with an elaborate apparatus of splints. Neither they nor Mr Skey (though he recognised the nature of the affection) succeeded in curing it. Psychological agents, however, effected a cure in a few minutes. She willed to use her foot like other people, and she did. "She accompanied her family to a ball, her foot, as she entered the ball-room, being not yet restored to its normal position. She was invited to dance, and under this novel excitement she stood up, and to the astonishment of her family, she danced the whole evening having almost suddenly recovered the healthy, muscular action of the limb. She came to see me," adds Mr Skey, "two days afterwards. She walked perfectly well into my room, and paced the room backwards and forwards with great delight. The actions of the limb were thoroughly restored, and all trace of the previous malady had disappeared" (xlv, October 13th, 1866). Fortunately no quack medicine or doctor aroused the Will in this case; fortunately, not only because they would have had the credit of the cure, but because the reality of the disorder would have been denied by those who have still to learn that such recoveries are possible, and that it

is one thing to admit the virtue of inert remedies, and another thing to recognise the secret of their frequent success.

The influence of the Will in controlling disease has already been incidentally referred to in the case of Irving. His own account of an attack of cholera may be made use of advantageously here.* During the invasion of the cholera in 1832 he was "seized with what was in all appearance, and to the conviction of medical men when described to them, that disease which has proved fatal to so many of our fellow creatures." He had risen in perfect health at his usual early hour. By breakfast time he had become very cold, and was labouring under severe pain. His appearance shocked his friends. Vomiting succeeded, and wringing or gnawing pains,† and being so weak that he could not sit up, he lay on the bed wrapped in blankets till he had to set out to preach at half-past eleven. It appears that he had a little brandy and arrowroot, but felt no better. With sunken eyes, pallid cheeks, and an altogether ghastly appearance, he tottered to the church, a quarter of a mile distant, and found another minister officiating for him. He was tempted to shrink back, but summoned resolution to tell his beadle to go into the pulpit and inform him that he would shortly take his place. In the meantime he stretched himself on three chairs in the vestry before the

* It should be observed that he held and preached that disease is sin, and that no one with faith need or ought to yield to it.

† A medical friend informs me that to his knowledge, Irving laboured under severe diarrhoea, and that his state at one time was that of dangerous collapse.

fire. "Even as I shifted my position I endured much suffering, and was almost involuntarily impelled to draw up my limbs in order to keep the pain under. Nevertheless, when I stood up to attire myself for the pulpit and went forward to ascend the pulpit stairs, the pain seemed to leave me." His sight was dim, his head swam, he breathed with difficulty, he laid hold of the pulpit sides and looked wistfully about, wondering what would befall him. The crisis came. "That instant a cold sweat, chill as the hand of death, broke out all over my body, and stood in large drops upon my forehead and hands. From that moment I seemed to be strengthened." He preached upwards of an hour with more unction than he had ever done before. After the service he walked home, eating little or nothing. Yet he preached in the evening in a crowded schoolroom, and next morning rose before the sun to pursue "with renewed strength" what he regarded as his course of duty. The narrative, Mrs Oliphant suspects, may cause some to smile, but it is impossible not to admire so resolute though mistaken a man ('The Life of Edward Irving,' vol. ii, pp. 309-13).

SECTION III.—Systematic Excitement of a definite Expectation or Hope, in regard to the beneficial Action of totally inert Substances

We may in a definite manner excite Hope, and direct it in a particular channel, by leading the patient to expect a certain result from drugs in which he has faith, but which are *totally* inert.

That this course may be systematically and successfully pursued, the cases which follow prove:—

M. Lisle, who has, among French physicians especially recognised the importance of acting upon the Imagination, making it, as he expresses himself, “un levier puissant, plus précieux que tous vos remèdes,” but who declares he is not able to explain why it is so potent an agent,* adopts the plan of treating some of his cases by pills composed of nothing more potent than bread crumb, and the results are what might be expected from the facts contained in this work. Of these pills, covered with silver leaf, he has two sets; the boxes containing one set labelled “Pilules argentées anti-nerveuses,” and the others “Purgatives.” He had in his establishment a hypochondriac who believed himself to be the victim of obstinate constipation, although in point of fact the bowels were regular. Of purgatives he had taken every form, but he affirmed, without any result. Dr Lisle refused to give him any medicine, and was in consequence incessantly importuned, and even abused by his patient. At last, one day, wearied out, he professed to yield to his solicitations, and told him he was about to give him the most violent purgative he knew, and that it would certainly render him very ill. With the greatest delight he obeyed Dr Lisle’s orders to take five of the pills from his “purgative” box, an interval of a quarter of an hour

* “I am not German or metaphysician enough to venture into this obscure region. I prefer frankly confessing my ignorance, and even that I only know that I know nothing about it. The fact stares me in the face, patent and indisputable, and *that* suffices me.”

being allowed between each. After the third dose the patient was well purged, and within seven hours the bowels were acted upon more than twenty times. He was jubilant at the successful operation of this new purgative, but was almost in a state of collapse with the attack, which, Dr Lisle says, he can only compare "à une attaque de cholérine des plus intenses." However, this proved to be a crisis in the patient's history, and the commencement of his recovery from Delusional Insanity ('L'Union Médicale,' October 23rd, 1861).

The following series of cases from 'The British and Foreign Medical Review,' January, 1847, was communicated by a naval surgeon, whom the editor, Sir John Forbes, characterises as an officer of long-standing and much experience, whose name and high character were known to him.

"A very intelligent officer had suffered for some years from violent attacks of cramp in the stomach. He had tried almost all the remedies usually recommended for the relief of this distressing affection; and for a short period prior to coming under care, the trisnitrate of bismuth had been attended with the best results. The attacks came on about once in three weeks, or from that to a month, unless when any unusual exposure brought them on more frequently. As bismuth had been so useful, it, of course, was continued; but notwithstanding that it was increased to the largest dose that its poisonous qualities would justify, it soon lost its effect. Sedatives were again applied to; but the relief afforded by these was only partial, while their effect on the general system was evidently very prejudicial. On one occasion, while

greatly suffering from the effect of some preparation of opium, given for the relief of these spasms, he was told that on the next attack he would be put under a medicine which was generally believed to be most effective, but which was rarely used on account of its dangerous qualities, but that, notwithstanding these, it should be tried provided he gave his assent. This he did willingly. Accordingly, on the first attack after this, a powder containing four grains of *ground biscuit* was administered every seven minutes, while the greatest anxiety was expressed (within the hearing of the party), lest too much should be given. The fourth dose caused an entire cessation of pain. Half-drachm doses of bismuth had never procured the same relief in less than three hours. For four successive times did the same kind of attack recur, and four times was it met by the same remedy, and with like success! After this my patient was ordered to join another ship on a different station."

In the next case, treated by the same medical man, constipation was relieved by the psychical method.

"A seaman had suffered from four successive attacks of constipation. So far as could be detected, there was no organic disease to account for its occurrence. The symptoms were such as usually follow protracted constipation of the bowels; and on all four occasions large and repeated doses of the strongest purgatives (croton oil included), powerful enemata, cold affusion, and hot baths had all been required to be persevered in to procure relief. On the fifth attack, he was put under grs. ij of bread pill every seven minutes; much anxiety being, of course, expressed to guard against any over-dose, as well

as to watch the effect of what was thus given. Within two hours he became sick (*one of the symptoms expected from the medicine*), and his bowels were freely open almost immediately after; nor did they again become constipated so far as I am aware."

Severe gastric and intestinal pain was removed in the following interesting case, by a like appeal to the Imagination, and is graphically described by the same hand:

"In July, 1845, the company of H.M.S.—were attacked with an epidemic bowel complaint, terminating in simple diarrhœa in some, but going on to dysentery in many. In every one of the latter cases, tapeworms (whether a cause or merely an effect, I am unable as yet to divine) showed themselves. Amongst others who suffered was H. B—, a first class petty officer, who had but a mild attack of dysentery, but who was much distressed towards the latter part of his attack, by tapeworm appearing in considerable quantities. As the dysenteric symptoms disappeared, these worms were attempted to be dislodged by every means that could be devised, and for a time it was supposed these means had been successful; but, as I feared, at too great a sacrifice, seeing the pain arising (as I fancied) from the large doses of powerful medicine necessary to effect this difficult object, continued around the pyloric orifice of the stomach and upper portion of the small intestines, to be most distressing. Counter-irritations were applied until the skin became callous, sedatives administered until the man's senses became muddled, but no course of treatment seemed to afford the least relief. This being so I determined to try the effect of mental influence. Stating to him, as I did to

the other men, that his disease was most obstinate, so was it necessary to have recourse to desperate means to relieve it; that, with his sanction, I would therefore put him under a medicine which it was most necessary to watch with the greatest attention, lest its effects should prove most prejudicial, perhaps fatal, &c. Having by these statements made an impression, it became necessary to keep it up. This was done by repeated visits at all hours of the day and night, and by expressing on these occasions the most intense anxiety as to the effect of the very powerful and dangerous medicaments. This was not a case in which a sudden effect could be expected to be produced, whatever might be the means employed. Symptoms of disease existed which bore too close a resemblance to those of an organic order to admit of hope of a sudden, if even of tardy, relief. Hence the pills (*bread*, of course) were given every sixth hour only. Within twenty-four hours the man's sufferings were decidedly less. Within four days he was almost free from pain. On the sixth day he was quite so, his pills were omitted, and at the end of a fortnight he was again at duty with a clear eye, a healthy skin, and was rapidly regaining his flesh. Here, as in most cases where this method has been tried, the diet and drink have been left unrestricted. Occasionally, however, it became necessary to taboo some article, lest its coming in contact with the remedy might prove most destructive; in other words, articles are occasionally forbidden when the mind seems to be inclined to lose sight of what must be made the all-important subject of thought by night and day. The wonderful improvement in this man's state was frequently

commented on by both officers and men, who, of course, were, and still are, as little acquainted with the means employed as the patient himself was.

“It may be said this case, as here given, goes for nothing, in so far as it does not show that the pains were anything but casual; in which case any other mode of treatment, or very likely no mode at all, would have been equally successful; or it may be, again, as it has before been said, that it was altogether feigned, and that the commanding officer would have made a better and quicker cure. I think not; and for the following reasons: the man’s flesh had wasted; his eye became sunken; his skin sickly in hue, as well as in feeling; his sleep, when he had any, was of the most disturbed character. But, more than all, the pain after some weeks returned, and the other bad symptoms followed in its wake; *yet both it and they were again relieved a second time by the same means.* While suffering from a third attack, he was sent to the Royal Naval Hospital at Malta, and then, after much suffering, he brought up by vomiting a portion of the mucous membrane of one of the small intestines, distinctly marked by two, at least, of the *valvulae conniventes*. I am assured by one of the officers of the establishment that he most carefully examined this ejected matter, and that its characters were so marked that there could be no room for a doubt as to what it was. This being so, we have pretty clear proof that disease existed long before this slough was thrown off; and that even this organic disease was suspended, on two occasions, by mental influence only.”

Sir John Forbes concluded his celebrated article on

“Young Physic” in the ‘British and Foreign Medical Review’ (January, 1846), with a dozen suggestions for medical practice, one of which was “To encourage the administration of simple, feeble, or *altogether powerless*, non-perturbing medicines, in all cases in which drugs are prescribed *pro formâ*, for the satisfaction of the patient’s mind, and not with the view of producing any direct remedial effect.” Whether his advice has been adopted to the extent which it deserves, may well be doubted. Nothing can justify asserting what is not true in order to gain the patient’s confidence—a course adopted in some of the foregoing cases—but this forms no essential part of the method of treatment now referred to. At the same time it is liable to degeneration into it. See observations in vol. i, p. 137 of this work.

SECTION IV.—Systematic Direction of the Attention to a particular region of the Body

The Attention may be definitely directed to the region affected, accompanied by the expectation of a certain result, without the administration of inert drugs.

Dr Carpenter gives several cases which well illustrate this method. A gentleman, somewhat hypochondriacal, required a daily aperient, being costive from sedentary pursuits. When medicine lost its effect, he applied to a medical man for advice, who, seating his patient before him, with the abdomen uncovered, requested him to direct his attention exclusively to the sensations he experienced in that region, acting upon his Expectation, by

assuring him that the desired action of the bowels would be secured, and pointing with his finger along the course of the arch of the colon and small intestines, so that his current of thought might pursue that direction. The experiment very shortly succeeded, "and for some time after, the bowels continued to act freely without medicine." It may be added in illustration of the same principle, though the case was not therapeutic in its character, that a lecturer was put to great inconvenience on one occasion by the threatened action of the bowels during the lecture. His Will triumphed; but ever afterwards he was troubled in the same way when he went to the same lecture-room, whatever precaution he might take, but not when he lectured elsewhere (viii, p. 953).

Although it is well known that powerful emotions act strongly upon the uterine functions, it is not so well understood how marked an influence an intellectual faculty, in the form of concentrated Attention, exerts over them. A striking case is reported by Mr Braid, which illustrates this fact very clearly. The effect took place, moreover, in a state of the system *not* rendered susceptible at the time by his special method. He had on previous occasions relieved a state of amenorrhœa by a mixed method, partly hypnotic and partly mental, but it then occurred to him that, inasmuch as he attributed his success in her case entirely to fixed mental Attention with a predominant idea (and faith in the result), he might succeed by the psychical process alone, *without sending her to sleep*—wide-awake, in fact. He tried the experiment, addressing her thus—"Now, keep your mind firmly fixed on what you know should happen." In the meanwhile he allowed his

own will to be passive, and read a book. At the expiration of eleven minutes the experiment ended, and the desired result took place within that period. The same treatment was adopted when required on subsequent occasions, and with the same success, with one exception, on which it is not less interesting to remark that the failure was due to her inability to fix her attention, "from having been put out of the way just before she came" to Mr Braid, and not expecting that the operation (if it may be called so) would succeed. To fix her attention thoroughly, therefore, it became necessary to hypnotise her, and then the function was restored (xxiii, p. 95-6). This case shows the value of Attention, pure and simple, but the greater power of the more complete psycho-physical method about to be described (Section VI).

SECTION V.—Combined Influence of arousing certain Mental States, and lightly touching the affected part

The same mental states may be more or less strongly called into action, assisted by a direct physical action upon the part. This is what occurs in the employment of the tractors, a very allowable mode of treatment, when the true principle at work is recognised. The Attention is first directed to the seat of disease, and is then conveyed from it, under the impression that the pain or other morbid sensation will concurrently pass away, and escape at the extremity of the limb or organ affected. Faith is no doubt a very useful adjuvant, but it does not appear to be essential; as in many instances the operator makes

no appeal whatever to this principle, and the patient does not anticipate benefit from the treatment. Lastly, there is the local traction, an unquestionable influence, although merely wooden tractors are employed, and one which has been too much overlooked by those who attribute the success attending tractorism *entirely* to mental agency. It is difficult to separate these complex influences, but it is clear that the simple passing of a substance, whether it be a wooden point or a finger, over the surface of a sensitive part of the body, must in itself exert a considerable influence over its capillary circulation, apart from its action in fixing the Attention.

I have before me a large number of cases of the successful treatment of disease by tractors, both metallic and wooden; but shall only select a few, in order to show their effect. It is sufficient to maintain, for the present purpose, that part of the result was due to mental influence.

At the time when the metallic tractors of Perkins excited so much attention, and their efficacy was attributed to galvanism, Drs Haygarth and Falconer, of Bath, selected certain patients in the General Hospital for their experiments, employing two wooden tractors of nearly the same shape as those used by Perkins, and painted so as to resemble them in colour.

The cases chosen were those of chronic rheumatism—in the ankle, knee, wrist, and hip. One attributed his pain to gout. With the exception of the hip case, the joints were swollen, and all had been ill for several months.

“Of five patients, all except one assured us that their

pains were relieved, and three of them that they were much benefitted by the first application of the remedy. One felt his knees warmer, and he could walk much better, as he showed us with great satisfaction. One was easier for nine hours, till he went to bed, when the pain returned. One had a tingling sensation for two hours. The wooden tractors were drawn over the skin so as to touch it in the slightest manner. Such is the wonderful force of the Imagination. [This requires some modification.]

“Next day, January 8th, the true metallic tractors of Mr Perkins were employed exactly in like manner, and with similar effects. All the patients were in some measure, but not more, relieved by the second application except one, who received no benefit from the former operation, and who was not a proper subject for the experiment, having no existing pain, but only stiffness of her ankle. They felt (as they fancied) warmth, but in no degree greater than on the former day” (lxxxiii, p. 3).

Dr H—, adds, “if any person would perform these experiments, they should be performed in due solemnity. During the process, the wonderful cures which this remedy is said to have performed, ought to be particularly related. Without these indispensable aids, other trials will not prove as successful as those which are above reported. [This is by no means certain]. The whole effect undoubtedly depends upon the impression which can be made upon the patient’s Imagination.”

Mr Richard Smith of the Bristol Infirmary, pursued the experiments commenced by Dr Haygarth, and with the following results :—

“Robert Thomas, æt. 43. He had for some time been under the care of Dr Savill, in the Bristol Infirmary, with a rheumatic affection of the shoulder, which rendered his arm perfectly useless.

“April 19th.—Having everything in readiness, I passed through the ward, and (in a way that he might suspect nothing) questioned him respecting his complaint. I then told him that I had an instrument in my pocket, which had been very serviceable to many in his state; and when I explained to him how simple it was, he consented to undergo the operation. In six minutes no other effect was produced than a warmth upon the skin, and I feared that this *comp d'essai* had failed. The next day, however, he told me that ‘he had received so much benefit, that it had enabled him to lift his hand from his knee, which he had in vain several times attempted on the Monday evening, as the whole ward witnessed.’ [The tractors used being made of lead, Mr. Smith thought it better to substitute for the future two wooden ones.] Mr Burton held in his hand a stop-watch, whilst Mr Lax minutated the effects produced. In four minutes the man raised his hand several inches, and he had lost also the pain in his shoulder, usually experienced when attempting to lift anything. He continued to undergo the operation daily, and with progressive good effect; for on the 25th he could touch the mantel-piece.

“On the 27th two common iron nails, disguised with sealing wax, were substituted for the pieces of mahogany before used. In three minutes he felt something moving from his arm to his hand, and soon after, he touched the Board of Rules which hung a foot above the fireplace.

This patient at length so far recovered that he could carry coals, &c., and use his arm sufficiently to assist the nurse; yet, previous to the use of the spurious tractors, he could no more lift his hand from his knee, than if a hundredweight were upon it, or a nail driven through it, as he declared in the presence of several gentlemen. The fame of this case brought applications in abundance.

“Thomas Ellis, a negro, from a chronic rheumatism in his upper and lower extremities, had been incapable of walking without support, or feeding himself, for four months. He came under my care on the 19th of April. At first the tractors produced no effect upon his thighs, and but little upon his arms. In the course of a few applications, however, he began to move his limbs better, and his nights were not so restless. He complained also that the cicatrix of an old scald upon his arm smarted a great deal. He now began to mend so fast that he could comb his hair very readily, and on the 29th he put on his jacket and walked across the ward without a stick or the least assistance. In the course of this case, the nails, lead, and wood were used alternately; but there did not appear to be the least difference in the result.

“My patients crowded in upon me so fast that I had not leisure to bestow more than four or five minutes upon each; yet such effects were produced as were almost incredible. It usually happened that the skin was soon warmer, and occasionally darting pains were produced, which sometimes were troublesome long after the operation, and at others were of shorter duration.

“John Peacock, a patient of Dr New, had been affected for four months with a weakness of the hip, and severe

rheumatic pains, brought on by working in a damp coal-pit. At first the tractors occasioned considerable pain, and very restless nights (I use his own words), but after a few trials he began to sleep unusually well, and had fewer attacks of pain, and appeared confident and happy in the idea that a remedy had been discovered for his complaints.

“With such a subject, the event may be easily anticipated. This morning he came to thank me for my services, and he was always exceedingly grateful to Mr Barton and Mr Gainsford, who operated upon him in my absence. I cannot help mentioning one circumstance respecting this man. He came to me one day complaining of a violent settled pain in his forehead, which he said almost distracted him, and requested me to draw it out. The pieces of mahogany were drawn gently over his forehead for a minute and a half, when the throbbing began to abate, and in two minutes had nearly ceased. In about three or four minutes the man arose from the chair, saying “God bless you, sir, now I am quite easy.” He was attacked with this pain only once afterwards, which affected his vision considerably, but it was removed as easily as in the former instance.

“All these cases turned out so happily, it may be imagined that they are *selected*. I declare, however, that they are the first that occur in the Minute Book; and if I could imagine it necessary to add more, there are several remaining equally successful.” Dr Haygarth gives the following:—

“Benjamin Quarman, who had received but little benefit from medicine, was obliged for some time to

hobble upon crutches with much difficulty and in great pain. He attributed his illness to a violent cold, caught by working in the mud on a pair of dock-gates. I must add, however, that he had been all his life a plumber, which contributes perhaps not a little to his indisposition. Upon the first application of the tractors (which were formed from a piece of bone) to his thigh, he experienced a pricking sensation; in a few minutes he could hardly persuade himself that they did not cut him; at the end of the operation he could use his limbs more freely, but complained that I had driven the pain into his knee. He was under the care of Dr Moncrieffe, who was present when Mr Lax relieved him, in a few minutes, of a pain which had been for some time fixed in the shoulder-blade. This man recovered considerably the use of his lower extremities, and was able to comb his hair easily, which the stiffness and pain in his shoulder had heretofore prevented him from doing" (op. cit.).

Dr Alderson adopted the same course of treatment in the Infirmary at Hull, with what result will be seen in the following case, which is taken from the same work:

"Robert Wood, æt. 67, on June 4th, was operated upon with (wooden) tractors for a rheumatic affection of the hip, which he has had for these eight months. During the application of the tractors, which was continued for seven minutes, no effects were produced, except a profuse perspiration, and a general tremor. On ceasing the application of the tractors, to his inexpressible joy, and our satisfaction, the good effects of our labour were now produced and acknowledged; for he voluntarily assured us that he could walk with perfect ease, that he had the

entire motion of the joint, and that he was free from pain. To use his own words, 'As to the pain I have now, I do not care if I have it all my life; that will matter nothing; you may take your medicines, I'll have no more of them.' And prior to his leaving the Infirmary he remarked how very warm those parts were where the tractors had been applied, and then walked from the Infirmary to his own house, assuring his companion that he could very well walk to Beverley.

"June 5.—Walked to the Infirmary this morning with very trifling difficulty; was so much pleased with the relief or rather cure obtained yesterday, that to use his own words again, he had very joyfully spread abroad the intelligence to his acquaintance. Has had some return of pain this morning, which, however, was removed by another application, and when asked how he felt, declared 'as bonny as augh,' and then marched off with a countenance expressive of his gratitude for the wonderful relief he had obtained" (op. cit.).

With such evidence as the foregoing of the advantage arising from the employment of wooden tractors, we may safely take the alleged success attending the use of metallic tractors as a fact, and only demur to the mode in which it is explained. The reader will find in the Autobiography of the late Mr John Vine Hall (1865) many remarkable cases recorded to prove the efficacy of tractorism. Even were his veracity not as unimpeachable as it is, there would be no reason for disputing the facts. For instance, take the two following cases:

"Miss D—, of Hunton, met with an accident six years

ago by a fall, which deprived her of the use of both her hands, so that she could not shut either; her knuckles were also much swollen and hard. She had been electrified several times, and had been under medical treatments several years without obtaining relief. She came to my house this morning, and on perceiving the state of her hands I prevailed on her to allow a trial of the tractors. The swelling and stiffness of the knuckles were reduced in ten minutes, and having applied the tractors twenty-six minutes to each hand she could open and shut them with perfect ease, pressing her fingers firmly upon the fleshy part of her hand" (p. 171).

"*Contraction of the hand from gout.*—Mr W. R—, of Maidstone, had long been afflicted with very severe attacks of gout, which frequently disabled him in his hands and feet. About four months ago his hand became so much contracted that he has not been able to close it to the present time, and the attempt to do so occasioned severe pain in the back of the hand, the skin being tense and hard. At his particular request I applied the tractors drawing them across the back of his hand, which produced a sensation of great warmth; he then endeavoured to close his hand which occasioned exquisite pain, and he was compelled to desist. I continued drawing the tractors over those parts where the pain was greatest, varying the application from the back of the knuckles to the end of the fingers. The skin on the back of the hand at length became soft, and in twenty minutes from the commencement of the operation he could open and shut his hand firmly without producing the least pain, except on the knuckle of the first finger. I then applied the tractors

a few minutes to this part and the pain entirely subsided” (p. 154).

It is to be regretted that in the following case of lock-jaw so few particulars are given to enable us to judge fairly of its true nature :

“ Mrs P—, a poor woman in Wharf Lane, Maidstone, was seized with locked-jaw four days ago, and continued in a most deplorable state, attended by a physician and a surgeon till this morning, when she was completely cured in fifty minutes by the application of the tractors. The medical gentlemen had been exerting themselves to the utmost, in the kindest manner, and one of them said he would give a hundred guineas, if he could save her life. This gentleman came into the room whilst I was in the act of using the tractors, which he had never seen before, but kindly said they should certainly have a fair chance, and he directed me where to apply them with the greatest advantage. I continued the operation for forty minutes without any apparent benefit, and then giving the tractors into the hands of the surgeon, returned to my own house awaiting the issue of their further application. In about twelve minutes the surgeon (Mr S—) came breathless with haste and delight to inform me that he had himself continued the use of the tractors, only ten minutes, when the poor creature opened her mouth. Mr S— was so fully satisfied of the efficacy of the tractors that he immediately purchased a pair for his own use. Mr S— writes, ‘ the case is yours, the suggestion was yours ; I merely continued the employment of the measure from the apparent hopelessness of medical means in relieving the distressing complaint. Although previously to the em-

ployment of the tractors, I had utterly given up the idea of saving my poor patient; although I feared medicine would prove wholly inefficacious, yet I am not prepared to say that certain death would have been the result; but I do not for a moment mean to impeach the effect of the tractors in this case. I feel conviction that they produced the cure' ” (p. 162).

With regard to the experiments, made by Dr Haygarth and others with wooden tractors, it can hardly fail to surprise the reader that these observers were content to stop when they had proved that these instruments were as potent as if metallic. They had relieved their patients by *something*, sooner than they would otherwise have been relieved; and yet it never seemed to occur to them to continue the practice. They called this something “Imagination,” and thought *that* was quite sufficient to dispose of the whole subject. This is, at least, as astonishing as that the public should believe in, and allow themselves to be cured by, the metallic tractors of Perkins and be content to refer the influence of galvanism. If, therefore, any medical reader should be disposed to say that there is no use in recurring to the exploded method of tractorism, I would simply ask whether in his practice he turns *the same principle* to account in any other form? If not, he obviously fails to employ what the Bath Hospital doctors proved to be a very potent remedy.

SECTION VI.—Effect of exciting certain Mental States (I) under conditions in which an influence may pass as alleged from A to B (ANIMAL MAGNETISM OR MESMERISM); (II) under conditions in which the operation of this Influence is precluded, or is not alleged by the defenders of Animal Magnetism to affect the results (BRAIDISM)

I. MESMERISM

If the true explanation of the *modus operandi* of Mesmerism* is to be found only in Animal Magnetism, it is

* The early stage of the mesmeric state, so well described by Agassiz in his own person, would probably be allowed by mesmerists themselves to be capable of induction by psycho-physical means alone. This description is so interesting that I append it:—
 “Neufchatel, Feb. 22nd, 1839. Desirous to know what to think of Mesmerism, I for long sought for an opportunity of making some experiments in regard to it upon myself, so as to avoid the doubts which might arise on the nature of the sensations which we have heard described by mesmerised persons. M. Desor and Mr Townshend (Rev. Chauncy Hare Townshend, A.M.) arrived here with the ‘Evening Courier,’ and at 10 p.m. Mr Townshend commenced operating on me. While we sat opposite to one another, he, in the first place, only took hold of my hands and looked at me fixedly. I was firmly resolved to arrive at a knowledge of the truth, whatever it might be; and, therefore, the moment I saw him endeavour to exert an action upon me, I silently addressed the Author of all things, beseeching Him to give me power *to resist the influence*, and to be conscientious in regard to myself as well as in regard to the fact.

“I then fixed my eyes upon Mr. Townshend, attentive to whatever passed. I was in very suitable circumstances; the hour being early, and one in which I was in the habit of studying, was far

from disposing me to sleep. I was sufficiently master of myself to experience no emotion, and to repress all flights of imagination, even if I had been less calm; accordingly, it was a long time before I felt any effect from the presence of Mr. Townshend opposite me. However, after at least a quarter of an hour, I felt a sensation of a current through all my limbs, and from that moment my eyelids grew heavier. I then saw Mr Townshend extend his hands before my eyes, as if he were about to plunge his fingers into them; and then made different circular movements around my eyes, which caused my eyelids to become still heavier. I had the idea that he was endeavouring to make me close my eyes, and yet it was not as if someone had threatened my eyes, and in the waking state, I had closed them to *prevent* him; it was an irresistible heaviness of the lids which compelled me to shut them; and by degrees I found I had no longer the power of keeping them open, but did not the less retain my consciousness of what was going on around me, so that I heard M. Desor speak to Mr Townshend, understood what they said, and heard what questions they asked me, just as if I had been awake, but I had not the power of answering. I endeavoured, in vain, several time to do so, and when I succeeded, I perceived that I was passing out of the state of torpor in which I had been, and which was rather agreeable than painful.

“In this state I heard the watchman cry ten o'clock; then I heard it strike a quarter past, but afterwards I fell into a deeper sleep, although I never entirely lost my consciousness. It appeared to me that Mr Townshend was endeavouring to put me into a sound sleep; my movements seemed under his control, for I wished several times to change the position of my arms, but had not sufficient power to do it, or even really to will it; while I felt my head carried to the right or left shoulder, and backwards or forwards, without wishing it, and, indeed, in spite of the resistance which I endeavoured to oppose; and this happened several times.

“I experienced at the same time a feeling of great pleasure in giving way to the attraction which dragged me sometimes to one side, sometimes to the other, then a kind of surprise on feeling my head fall into Mr Townshend's hand, who appeared to me for

the first time to be the centre of attraction. To his inquiry if I were well, and what I felt, I found I could not answer, but I smiled; I felt that my features expanded in spite of my resistance; I was inwardly confused at experiencing pleasure from an influence which was mysterious to me. From this moment I wished to wake, and was less at my ease, and yet, on Mr Townshend asking me whether I wished to be awakened, I made a hesitating movement with my shoulders. Mr Townshend then repeated some frictions, which increased my sleep; yet I was always conscious of what was passing around me. He then asked me if I wished to become lucid, at the same time continuing, as I felt, the frictions from the face to the arms. I then experienced an indescribable sensation of delight, and for an instant saw before me rays of dazzling light which instantly disappeared. I was then inwardly sorrowful at this state being prolonged; it appeared to me that enough had been done with me; I wished to awake, but could not. Yet when Mr Townshend and M. Desor spoke I heard them. I also heard the clock, and the watchman cry, but I did not know what hour he cried. Mr Townshend then presented his watch to me, and asked if I could see the time, and if I could see him, but I could distinguish nothing; I heard the clock strike the quarter, but could not get out of my sleepy state. Mr Townshend then woke me with some rapid transverse movements from the middle of the face outwards, which instantly caused my eyes to open, and at the same time I got up, saying to him, 'I thank you.' It was a quarter past eleven (about an hour having elapsed since I passed into the mesmeric state). He then told me, and M. Desor repeated the same thing, that the only fact which had satisfied them that I was in a state of mesmeric sleep, was the facility with which my head followed all the movements of his hand, although he did not touch me, and the pleasure which I appeared to feel at the moment when, after several repetitions of frictions, he thus moved my head at pleasure in all directions."—AGASSIZ (lxxxviii, p. 388). The sensations experienced by several persons when hypnotised, are recorded by me in the 'Journal of Mental Science,' in an article on "The Mental Condition in Hypnotism." (April, 1883.)

clear that it does not properly fall under our consideration. If cures of disease are performed by a magnetic influence passing from A to B, they are not (as has already been intimated) illustrations of the influence of A's Mind upon B's Body; the phenomena with which alone we are now concerned. If I assume (as most medical men would), that no such influence exists, and use the cases which Mesmerists have published, as examples of a merely psycho-physical power, I shall be charged by them with not excluding a possible source of error. On the other hand, by rejecting these cases I lose a mass of evidence which otherwise forcibly supports the influence of mental states upon bodily disease. If I were to refer, in this chapter, all the phenomena induced by mesmerists, to the monotony of sensory impressions and Expectation I might easily fill it with successful and highly important cures performed through the influence of the Mind upon the Body.* And if I do not pursue this course here, I may, at any rate, ask those who do not for a moment doubt that they belong to the same class of facts as those detailed under Braidism, to give them that attention which they surely deserve from this point of view, no less than if they were due to magnetism, and to make use of them under some form of psycho-therapeutics, whether it be through the Imagination, Attention, or Faith. The observations on this subject of Dugald

* My own view is that Mesmerism should be practised under the name of hypnotism or Braidism to prevent a confusion of ideas as to its real nature; but full credit should be given to those who performed mesmeric cures long before Mr Braid's time. Better, however, cure disease under a name which is associated with an unproved theory, than refuse on that account to employ it.

Stewart, an impartial observer of the discussion carried forward in his day with so much acrimony, are so excellent that they will bear repeating here.

"It appears to me," he says, "that the general conclusions established by Mesmer's practice, with respect to the physical effects of the principle of Imagination (more particularly in cases where they co-operated together), are incomparably more curious than if he had actually demonstrated the existence of his boasted science; nor can I see any good reason why a physician who admits the efficacy of the *moral* agents employed by Mesmer, should in the exercise of his profession scruple to copy whatever processes are necessary for subjecting them to his command, any more than that he should hesitate in employing a new physical agent, such as electricity or galvanism" (xi, iii, p. 221).

Assuming that the first French Commission on Animal Magnetism (1784) were correct in regarding the phenomena as fairly referable to Imagination and Imitation, we must agree with them that they constitute the groundwork of a NEW SCIENCE—that of the Moral over the Physical, or as they again express themselves, "the power which man has over the Imagination may now be reduced to Art and practised methodically."

Let us take, for instance, the relief of disease afforded by a highly respectable surgeon, and attributed by him to Mesmerism. It is a case of hemiplegia, and is thus reported by the late Mr Tubbs, of Upwell, Cambridgeshire. Those who knew this gentlemen will not call in question his veracity, however much they may differ from his theory.

“Edward Wine, æt. 75, had been paralysed *two years* in one arm and leg. The left arm was spasmodically fixed to the chest, the fingers drawn towards the palm of the hand and wasted, quite incapable of holding anything; the lower lip was drawn a little down, and could not hold the saliva, which dropped out at the side of his mouth; when walking would draw the left leg after him. His gait was tottering, and for two years he was never known to walk without a stick. Was locally mesmerised May 21st. In forty minutes he felt me draw a pain from his shoulder to his fingers' ends. After the pain was gone he felt as if he could flex and extend the arm, and he accordingly did. By the next operation he managed to hold a spatula in his hand, and exclaimed that he should now be able to eat all the victuals from his old lady. He was able to walk up a staircase into my photographic department, where I took his likeness while he was mesmerised by M. Disnay. He was mesmerised twice a day, and always felt more power in the arm and leg. Last Sunday, I stuck a nosegay in his coat and posted him off to church, and he tells me he walked like a gentleman down the aisle, carrying his stick in his lame arm. There being a disposition in his fingers to contract, I have made him wear a splint. I ought not to omit an important feature in his case; his incontinence of urine is nearly cured” (xxxvi, April, 1855).

My friend Dr Proctor, of York, attended some years ago a chemist of that city for, he states, “an affection of the bladder and kidneys, accompanied by considerable diuresis, and during sleep there was involuntary discharge of urine that rendered his situation most distress-

sing." Dr Proctor adds. "All the usual plans of treatment were had recourse to, and the opinion of one of our eminent physicians taken, without any benefit resulting therefrom." The patient was recommended to try Mesmerism, and did so. Dr Proctor says, "the effect was certainly wonderful; the involuntary discharge of urine ceased at once, and the quantity became considerably diminished; and though certainly his general condition was not materially benefitted, the removal of the previously mentioned symptom, rendered his life comparatively comfortable, and greatly diminished his sufferings" (xxxvi, 1851). In this case no mesmeric coma was induced, but the usual passes were made, and even on the first occasion produced a state of control over the bladder which had not existed for twelve months. The patient said afterwards that he was opposed to the trial of this process and expected no result; "therefore," he says, "it could not be the effect of Imagination." But although it was not the result of expectant Imagination, it does not follow it was the effect of any other influence than that of his own mind (*e.g.* Attention) upon his body. Confusion of ideas as to this distinction is exceedingly common. If "passes" assist the direction of the Attention, by all means let them be used. Dr Elliotson said with great force, in regard to the removal of "ganglions" by mesmeric passes, without friction, "Mr Braid, Dr Carpenter, and Dr Holland, must ascribe these cures to dominant ideas, suggestion, and expectant attention, and ought to petition for the introduction of these into the next 'Pharmacopœia' of the Royal College of Physicians." We do make this petition; at any rate, let these psychical

agents be included in the *Armamenta Medica* of every medical man. I have already shown (vol. ii, 176) that Dr Elliotson admitted that *some* of the effects of Mesmerism might equally well be attributed to the simple action of mental states upon the body, and I am not sure that he would have wholly denied the *possibility* of the relief afforded, in the foregoing cases, being due to the influence of the Attention and other mental states, assisted by local manipulation. If it be so, it would not be unfair to class these and similar cases of relief, or cure, under the next division—that of Braidism. All, however, we urge here is this, that so far as such cases may be fairly and sufficiently explained by the influencing principles which form the subject of the present volume, they may be employed to prove the great importance of utilising these principles in practice. Of course, even if shown to be due to a magnetic fluid, it is none the less the duty of medical men to use the mesmeric method, but it forms from this stand-point no part of our own programme. We may, however, employ it if found to be beneficial, and until convinced to the contrary, attribute its success to the operation of any mental state which we honestly believe, from the effects produced in those cases in which extraneous agencies are excluded, to be sufficient to explain the result.

Deleuze records a case which should be read in connection with one reported by Mr Braid in the next section, which is very similar. Here it would be reasonable to conclude that the mesmeric cure depended for its success on the same principle as that which obtained in the hypnotic process; and if so, animal magnetism is excluded.

Deleuze says, "Opacities in the cornea of the eye have been frequently made to disappear. I am acquainted with a woman whom this disorder, produced by small-pox, had deprived of the use of one eye, and who recovered it while being magnetised for another disease." He adds that Dr Geritz was consulted about a girl, eight or nine years of age, "who, from the same disease, had one eye entirely covered with a film so thick that she could not see the light. He judged, as did all the physicians who had been consulted, that the disease being incurable by ordinary means, it was useless to administer remedies ; but the child having inspired him with much interest, he resolved to undertake her treatment with magnetism. During two months the action appeared absolutely powerless ; the third month the film grew thinner and in the succeeding one the cure was complete" (lxxxvii, p. 146).

II. BRAIDISM

If the influence of Mind upon Body can be utilised so as to throw the system into a state in which this influence is intensified, then it is reasonable to hope that psycho-therapeutics will be especially likely to prove beneficial. Now this is what Braidism or Hypnotism, whether it induces sleep or not,* effects. The physical strain to which the eyes are subjected may have some influence in exhausting the cerebral force generally or partially through the third pair, and may so allow of the action of the sympathetic upon certain regions of the encephalon, thus

* Mr Braid did not induce unconsciousness in more than one in ten cases.

suspending the functions of some parts and rendering others more acutely impressible ; but the mental strain involved in Attention, has also much to do in producing this result. On this aspect of the subject, the reader is referred to vol. i, p. 11 of this work. Here we shall give a few proofs of the successful results of this mode of treating disease in the hands of Mr Braid, which, in many instances combines psychical and physical elements of treatment, the former, however, being the most interesting and important part of the system. "When we consider," "that in this process we have acquired the power of raising sensibility to the most extraordinary degree, and also depressing it far below the torpor of natural sleep ; and that from the latter condition, any or all of the senses may be raised to the exalted state of sensibility referred to, almost with the rapidity of thought, by so simple an agency as a puff of air directed against the respective parts ; and that we can also raise and depress the force and frequency of the circulation, locally or generally, in a most extraordinary degree, *it must be evident we have thus an important power to act with [in the cure of disease].* Whether these extraordinary physical effects are produced through the Imagination chiefly,† or by other means, it appears to me quite certain *that the Imagination has never been so much under our control, or capable of being made to act in the same beneficial and uniform manner, by any other mode of management hitherto known*" (vi, p. 5).

To the foregoing should be added Mr Braid's own

† Mr Braid gives proof that, independently of the imagination, the phenomena are produced by the fixation of the mind and eyes, and general repose of the patient.

definition of Hypnotism, "a peculiar condition of the nervous system, induced by a fixed and abstracted attention of the mental and visual eye, on one object, not of an exciting nature;" and also his process of inducing it; viz., "Take any bright object between the thumb and fore and middle fingers of the left hand; hold it from about eight to fifteen inches from the eyes, at such a distance above the forehead as may be necessary to produce the greatest possible strain upon the eyes and eyelids, and enable the patient to maintain a steady fixed stare at the object. The patient must be made to understand that he is to keep the eyes steadily fixed on the object, and the mind riveted on the idea of that one object. . . . After ten or fifteen seconds have elapsed, by gently elevating the arms and legs, it will be found that the patient has a disposition to retain them in the situation in which they have been placed, *if he is intensely affected*. If this is not the case, in a soft tone of voice desire him to retain the limbs in the extended position, and thus the pulse will speedily become greatly accelerated, and the limbs in process of time will become quite rigid and involuntarily fixed. It will also be found that all the organs of special sense, excepting sight, including heat and cold, and muscular motion or resistance, and certain mental faculties, are, *at first*, prodigiously *exalted*, such as happens with regard to the primary effects of opium, wine, and spirits. After a certain point, however, this exaltation of function is followed by a state of depression, far greater than the torpor of *natural* sleep. From this state of the most profound torpor of the organs of special sense, and tonic rigidity of the muscles, they may, at this

stage *instantly* be restored to the *opposite* condition of extreme mobility and exalted sensibility, by directing a current of air against the organ or organs we wish to excite to action, or the muscles we wish to render limber, and which had been in the cataleptiform state" (p. 30).

Of the numerous cases published by Mr Braid it is difficult to know which to select; they all so forcibly illustrate the success of his method. In the following case, condensed from his report, the sight was affected:

In June, 1854, Miss R— consulted Mr Braid. A year before she had an attack of ophthalmia, which yielded so far to treatment that she got out of doors in a month. Then a pole fell on the upper and left side of the head, two or three days after which she suffered severe pain, and suddenly became quite blind on that side, with dilated pupil. After four months' medical treatment, sight was partially restored. In January, 1854, while reading, she suddenly lost the sight of the other eye, accompanied with dilated pupil. A few days after, she struck the same part of the head as before against the mantel-shelf, which was followed by loss of sight of the left eye. She was now led about in a state of total blindness, and was sent to Dublin to be under Mr Wilde, under whose care she remained six weeks and derived decided improvement, for the iris had become somewhat sensitive to light, and she was able to discern large objects, but could neither see to read nor write. She now returned home, but the improvement in spite of treatment being stationary, her medical attendant recommended her to try hypnotism under Mr Braid. He found no apparent

physical imperfection to account for impaired vision, nor was there any pain about the head or eyes "which had very much the appearance of an incipient case of amaurosis, only the pupils were not quite so much dilated." She could not discern a single letter of the title-page of a book, although some were a quarter of an inch long. "Having hypnotised the patient and directed the nervous force to the eyes, by wafting over them and gently touching them occasionally so as to keep up a sustained act of attention of the patient's mind to her eyes and the function of vision. She was aroused in about ten minutes. I now presented before her the title-page of the same book, when she instantly exclaimed, with delight and surprise, 'I see the word commerce!' pointing to it. I now told her she would see more than that presently; and in a little while she exclaimed, 'I see commercial,' then 'I see dictionary;' and shortly after, 'I see McCulloch,' but she could see nothing more. I told her that after a little rest, I felt assured, she would see still smaller print; and after a few minutes, she was able to read 'London, Longman, Green and Longmans.' Such was the result of my first process. After a second hypnotic operation, next day, the patient could read, when first aroused, the whole of a title-page of a pamphlet; and in about five minutes after, she read two lines of the text. After another operation, the same day, she could read the small close print in the appendix; and was able the same evening to write a letter home reporting progress, for the first time for twelve months. She only required two more hypnotic operations, when she was found able to read the smallest sized print in a newspaper; after which

she left me, quite cured, and as I have heard, she has continued well ever since" (lxxxiv, p. 36). No medicine was given.

In another case, Mrs Stowe, aged 44, who from weak sight had used spectacles for twenty-two years, and could not, without them, distinguish the capital letters of advertisements in a newspaper, nor the large heading of the paper, was able to read both the large and small heading, the day, month, and date of the paper, after being hypnotised by Mr Braid for eight minutes, and in returning home could read the sign-boards which she had not done for years before. Her sight continued to improve—she could thread her needle, No. 8, without spectacles—and Mr Braid states "this patient has retained the improvement of her sight" (vi, p. 170).

One case reported by Mr Braid is particularly interesting, because it proves the effect which may be produced when the affection is not in any degree "on the nerves," for actual opacity of the cornea was removed (compare vol. i, 155 of this work). Mrs S— had severe rheumatic fever in 1839, during the course of which the left eye became implicated, involving both its internal and external structures. When seen by Mr Braid in 1842, the eye was free from pain, but was of no service. There was opacity over more than one half of the cornea, sufficient to prevent distinct perception of any object placed opposite the temporal half of the eye, all being seen through a dense haze, and objects placed towards the opposite side were seen very imperfectly, owing to the injury the choroid and retina had sustained in the points on which the images of such objects were reflected. The opacity

was not only an obstacle to distinct vision, but was also a source of annoyance from its disfigurement, being obvious even to those at a considerable distance. She was a relation of Mr Braid, and was in his house three months before he operated upon her, during which time no change took place. Violent pain in the arm and shoulder induced her to submit to the hypnotic treatment, which proved successful; but what was more surprising and quite unlooked for by Mr Braid, her *sight* was so much improved that she was able to see everything in the room, and to name different flowers, and distinguish their colours, whilst the right eye was shut, which she had not been able to do for more than three years and a half previously. The operation was continued daily, and in a very short time *the cornea became so transparent, that it required close inspection to observe any remains of the opacity*. After the first operation there was considerable smarting in the eye, which continued all night, and in a less degree, after future operations, which, no doubt, roused the absorbents and effected the removal of the opacity. Stimulating the optic nerve to greater activity, however, must have been the chief cause of the very rapid improvement, which enabled her to see objects after the second operation. Mr Braid adds to the foregoing, that objects were seen from the temporal side of the eye much more distinctly than from the nasal side, owing to the irreparable damage the retina and choroid had sustained (vi, p. 175).

Mr Braid was successful in exciting the sense of hearing in even the deaf and dumb. The following is one of the cases recorded:—

Nodan, deaf-mute, æt. 24, “was never considered to

have the power of hearing, properly so-called, according to the opinion of the head-master of the Deaf and Dumb Institution (Mr Vaughan), where he was a pupil; after the first operation (including hypnotism, then extending the limbs, and fanning the ears), I satisfied myself he had no sense of hearing; but after the second, which I carried still further, he could hear, and was so annoyed by the noise of the carts and carriages when going home, after that operation, that he could not be induced to call on me again for some time. He has been operated on only a few times, and has been so much improved, that although he lives in a back street he can now hear a band of music coming along the front street, and will go out to meet it. I lately tested him, and found he could hear in his room on the second floor a gentle knock on the bottom stair. His improvement, therefore, has been both decided and permanent, and is entirely attributable to hypnotism, as no other means were adopted in his case" (vi, p. 182).

Mr Braid's method was not only effective in cases of hysterical paralysis, but was certainly beneficial in those in which serious organic disease was present. Thus, "a gentleman, *æt.* 60, had a paralytic stroke two years and a half before consulting me, which deprived him entirely of the use of the right arm, and enfeebled the right side and leg. When he called on me, he walked very feebly, could scarcely close the fingers and thumb, and could not extend them fully. He could, with great difficulty, raise the hand as high as the pit of the stomach; the pupil of the right eye was considerably larger than the left, and not quite circular; speech very imperfect. After being hypnotised for five minutes he was able to

open and close the hand freely, and to raise the hand above the head, and pass it to the back of the head, and he could also walk and speak much better. Pulse regular; before the operation, it was very irregular." Seven weeks after, Mr Braid reports that the improvement was permanent. "He could speak and walk much better, could raise the arm and move the fingers and hand freely, could pass the hand above and over the head, and take off his hat with it. The right pupil was also quite circular now, and nearly the same size as the other" (vi, p. 215).

In another case, T. J—, æt. 36, had a paralytic seizure, which deprived him of feeling and motion of the left arm and hand. Nearly three months after, Mr Braid saw him. He had partially recovered the use of his fingers, and could raise his arm nearly to the horizontal position, but just before he was seen by Mr Braid he had had an accession of the paralytic symptoms, and the arm was spasmodically fixed to the side. After being four minutes hypnotised he could move the fingers, hand, and arm freely, elevating it above his head, and retaining it in any situation he was asked. The feeling, however, remained very imperfect. He was subsequently hypnotised, and in four days the feeling as well as power was restored. He remained well (p. 217).

The following instance of relief from rheumatism is important because there was no Faith, Expectation, or Imagination present to cause it. The mental element was therefore confined to the Attention. Compare this with remarks *ante* at pp. 250-1.

"Mrs P—, upwards of 50, had suffered so severely from rheumatism that she had not enjoyed a sound night's

rest for seven months. External and internal means, which had been beneficial in a former similar attack, had been tried without effect before I was sent for to visit her. She was suffering excruciating pain in one leg, particularly above the knee-joint. When I proposed to relieve her by hypnotism she repudiated the idea, told me she had no faith in it, and felt assured in her own mind that such an operation could be of no use to her. I told her I cared little for her want of faith in the remedy, provided she would submit to be operated on as I should direct. She at last consented, and in the presence of her three daughters, was hypnotised. In eight minutes she was aroused, and was quite free from pain; wished to know what I had done to her; said she felt sure hypnotising her could not have relieved her. To this I replied by asking where her pain was felt now. She answered she felt no pain, but persisted she was sure I had done nothing to take it away. The manner in which she could walk and move her limbs, was sufficient proof the pain was gone, notwithstanding her scepticism about the agency. When I called next day I was informed by her family that *she had slept comfortably all night*, and had gone out, being quite well. Two days after I called again, and was informed by her that she had been overtaken in a shower, and had over-exerted herself on that occasion, and had had a return of the pain, although not so bad as at first. I hypnotised her again with complete relief, and she has never required a repetition of the operation since, so that she has now enjoyed a release from her old enemy for eleven months, in defiance of her scepticism" (vi, p. 235). This fact is most important.

We will only cite another case of rheumatism, that of a boy, æt. 12, who was suffering from a violent rheumatic affection of the legs, back, and chest, so that he required to be carried into Mr. Braid's house. After being hypnotised, he was so much relieved as to be able to walk about the room freely, and to walk to his cab without assistance. Next day he called and was hypnotised again, and left quite free from pain, and remained so well as not to require another operation. This boy took no medicine, and had no external application (*loc. cit.*).

The influence of Braidism when carried to the stage of "nervous sleep," must be regarded as among the secondary effects of psycho-physical agents. Sound and refreshing sleep in cases of insomnia is no insignificant blessing; and we have no doubt there may be instances in which to produce it by acting upon the mind, is more beneficial in the long-run than by employing even chloral or bromide of potassium. So in regard to psychical anæsthesia, in view of the danger to life, which attends the employment of chloroform, &c., there may be cases in which it is safer, although it may be more tedious. See p. 35 of this work.

Quite recently, at a meeting of the Medico-psychological Association, one of the speakers, Dr Huggard, mentioned having made a practical application of hypnotism which is of much interest.

A lady* at Sussex House Asylum, Hammersmith, æt. about 45, and labouring under melancholia accompanied with cataleptic symptoms, "refused her food from the

* The case is taken from the report of the meeting in the 'Journal of Mental Science,' July, 1883.

belief that it was poisoned, and on several occasions it was necessary to use the stomach-pump. At this time the speaker impressed with Dr Hack Tuke's paper on "Hypnotism," and Tamburini's and Sepelli's experiments on the same subject, had recourse to this agent. The dangling of a bunch of keys for a few minutes before the patient's eyes brought on the hypnotic sleep. While in this state any idea suggested was believed, and commands were obeyed. She was ordered to eat and she ate. She was ordered to drink and she drank. She was ordered to go through various quick movements and she did so. She was told that she was the happiest mortal in the world and was desired to laugh; her face lighted up, an unaccustomed smile came upon her lips, the croaking noise of unwonted and almost forgotten laughter was heard, which soon however, with practice, softened into more natural sounds. Hypnotism was employed off and on for a week and was then discontinued lest a habit should be formed; but during the employment of this means, marked improvement was observed which had continued and now the lady was convalescent. In this case a new device was adopted to compel the ingestion of food. But more than this, an opportunity was afforded of reaching and exciting to action long disused nervous channels."

The foregoing cases constitute, in my opinion, a most practical answer to the questions with which we commenced the chapter; more practical, probably, than those which have been given under the other modes of treatment, which involve the action of Mind upon Body in the cure of disease. Braidism possesses this great advan-

tage, that, while the Imagination, Faith, or Expectation of the patient may be beneficially appealed to, this is not essential ; the mere concentration of the Attention having a remarkable influence, when skilfully directed, in exciting the action of some parts, and lowering that of others. The short period of time required, also, compares favourably with that consumed in some other forms of mental therapeutics. It is to be hoped that fresh interest will be awakened in this method of relieving pain, defective action of the nerves of special sense, and neuro-muscular affections, whether arising from excessive or defective action, and that a more general use will be made of it by those who are engaged in the active practice of their profession.

Lord Bacon, with his wonderful range of vision, both physical and metaphysical, did not omit to hint at "the inquiry how to raise and fortify the Imagination ; for," he adds, "if the Imagination fortified have power, *then it is material to know how to fortify and exalt it*" (xiv, i, p. 127). He enters a protest against charms, characters, and ceremonies, but observes that, in regard to "the operation of the conceits and passions of the Mind upon the Body, we see all wise physicians, in the prescriptions of their regimens to their patients, do ever consider *accidentia animi* as of great force to *further* or *hinder* remedies, or recoveries." He says, "It is an inquiry of great depth and worth concerning Imagination, how, and how far it altereth the body proper of the Imaginant." It does not follow, indeed, that, because "it hath a manifest power to hurt, it has the same degree of power to help. But the inquisition of this part is of great use, though it

needeth, as Socrates said, 'a Delian diver,' being difficult and profound."

If for the word Imagination we substitute Mental States, may we not say that Mr Braid has proved himself the Delian diver whom Bacon hoped to see ?

SUMMARY.—I. The influence of the Mind upon the Body, shown in Parts I, II, III, to operate powerfully in health, is at least as powerful in disease, and may be highly beneficial in aiding the *vis medicatrix*, and opposing the *vis vitiatrix Naturæ*. Its action may be gradual ; or sudden, as in the shock of a railway accident (see *Preface*).

2. This truth is by no means confined, as it is often supposed to be, to nervous disorders, but extends to other diseases.

3. The principle may be carried out, in a general way, by calming the mind when the body suffers from its excitement ; by arousing the feelings of Joy, Hope, and Faith ; by suggesting motives for exertion ; by inducing regular mental work, especially composition ; by giving the most favourable prognosis consistent with truth ; by diverting the patient's thoughts from his malady ; and thus, in these and other ways, influencing beneficially the functions of Organic Life through the Mind.

4. The influence of the Will upon disease, apart from voluntary Attention, is a very important agent in Psychotherapeutics.

5. The effects accidentally produced upon the body by mental impressions, in disease, can be imitated, and the arts employed by the empiric (see *Preface*) can be divested of their non-essentials, and systematically utilised.

6. There are various methods by which this may be effected, and it is not necessary to adopt any one to the exclusion of the rest ; but Braidism offers great advantages.

7. The great principle which appears to be involved in all, is the remarkable influence which the mind exerts upon any organ or tissue to which the attention is directed to the exclusion of other ideas, the mind gradually passing into a state in which, at the desire of the operator, portions of the nervous system can be exalted in a remarkable degree, and others proportionately depressed ; and thus the vascularity, innervation, and function of an organ or tissue can be regulated and modified according to the locality and nature of the disorder.

8. The psychical element in the various methods comprised under psycho-therapeutics is greatly assisted by physical means, as gentle friction, pointing, passes, &c. ;* and this in two ways ; first, by more definitely directing the Attention to a part in which it is desired to set up healthy action ; and secondly, by locally exciting the vascular and nervous activity, or directing it into another channel. In Braidism the physical element is still further employed in straining the eyes, and so exhausting some portion of the brain.

9. Unconsciousness may or may not be induced ; the relief and cure of disease following the processes adopted

* In his 'Nature and Art in the Cure of Disease,' Sir John Forbes (under the head of regimenal means desirable to adopt) includes "the sight of monotonous mesmeric passes, or fixed attention on an object, to produce mesmeric sleep or hypnotism ; and" (under the head of physical means) "mesmeric and hypnotic manipulations."

when the patient remains conscious of what is going on. When there is sleep, its character resembles that of somnambulism and not ordinary sleep.

10. Potent as is the influence of mere Attention directed to a particular region of the body, it may be neutralised by a contrary Expectation, and intensified by Faith and a vivid Imagination.

CHAPTER XVIII

CONCLUSION

WE have now completed our survey of Psycho-physical Phenomena ; those resulting from the action of the Mind upon the functions of the Body, short of disease, and which may be classed under Psycho-physiology ; those constituting morbid states and which should be included under Psycho-pathology ; and lastly, those phenomena involving restorative processes, which justify the employment (in addition to physical remedies) of a reasonable Psychopathy, or Psycho-therapeutics—a preferable term in an age when the multiplication of *pathies* is undesirable.

Let us briefly glance at the broad principles and the most salient facts which have come under our notice in this investigation into Psycho-physical Phenomena.

We have seen that the influence of the Mind upon the Body is no transient power ; that *in health* it may exalt the sensory functions, or suspend them altogether ; excite the nervous system so as to cause the various forms of convulsive action of the voluntary muscles, or depress it so as to render them powerless ; may stimulate or paralyse the muscles of organic life, and the processes of Nutrition and Secretion—causing even death ; that *in disease* it may restore the functions which it takes away in

health, re-innervating the sensory and motor nerves, exciting healthy vascularity and nervous power, and assisting the *vis medicatrix Naturæ* to throw off diseased action or absorb morbid deposits.

Sir John Forbes assuredly did good service to medicine by showing the extensive influence of this force in the cure of disease. He thought as is well known that the curative powers of nature suffice to explain all the triumphs of homœopathy. But he also thought that the influence of the Imagination should be reckoned among "some of the additional influences essentially connected with the exercise of a new system." His great object indeed, was to prove that "nature can cure diseases without assistance from art," and he adduces in proof "the cure of diseases among uncivilised nations of ancient and modern times, under the sole influence of magic charms or other practices equally ineffective."

With regard to Faith it is true that it can never be placed on a par with the action of a drug like jalap, the effect of which is certain and independent of faith or belief. It will act equally upon the intelligent and upon the ignorant, whereas we cannot resort to faith in a case in which the patient possesses such knowledge as prevents his power to believe that he will be cured by *nil*. He may know very well that faith alone will cure as an abstract truth, but for himself he cannot have faith in faith alone. Hence the limitation of the principle of cure by faith. As a fact, indeed, medical men are the least easily relieved by medicines, because they want faith and are too thoughtful. It is but too true in regard to those who are labouring under disease *Minus credunt, quæ ad salutem*

suam pertinent, si intelligunt (Pliny). If it is a blessing to savage nations that the medical art should be introduced, it must not be forgotten, and it is a satisfaction to reflect that the means resorted to previously by the natives, even when consisting solely of charms and incantations, had been attended by the relief of pain and the cure of disease. The savage is without the never ceasing interest which attaches to the pursuit and acquisition of knowledge, but he who knows most, pays the penalty of his superiority in this respect by the loss of that healing charm which springs from unhesitating medical faith. True, faith alone will not cure a certain number of diseases, but alas ! neither will our *Materia Medica*, and the line which separates the possible and the impossible in the one case, too often proves identical with that which separates them in the other.

From this point of view, scepticism in the physician is the best means of arriving at the truth, faith in the patient the best means of arriving at health. Doubt is the key by which to open the treasure-box of medical knowledge ; Belief is the lock which the patient must not break if he wish to procure the blessings of health.

We have seen the importance of the reflex action of the Mind or the Brain upon the Body on the one hand, and of the Will on the other, the former occasioning a host of disorders of sensation and motion, and the latter exerting great power over the system directly and indirectly ; directly, in controlling reflex action of the nervous centres whether encephalic or spinal ; indirectly, by acting on the mind itself, in disposing it to pass into such states as shall excite certain bodily functions, by virtue of

those well-recognised psycho-physical laws which then come into operation.

We have also seen the far-reaching influence of that antagonism which appears to exist between the two great divisions of the nervous system in regard to vascularity. Upon this principle we have had again and again to fall back, in endeavouring to trace the mode in which so many striking physical phenomena succeed to varying mental states. The normal equilibrium which we witness between the cerebro-spinal and the sympathetic systems, as respects their influence upon the blood-vessels, is obviously more or less interfered with, when the mind or brain is unable to exercise its accustomed force, or when it transmits a more than wonted impulse; allowing the unrestrained action, or paralysing the influence of the sympathetic vaso-motor nerves. The general impression that the emotions act specially upon the sympathetic system is, on this hypothesis, only true in the sense that this system is liberated to act with excessive force, or prevented acting as in health, by the change wrought, in the first instance, in the organ of the mind. At the same time it is difficult to see any reason why there should not be a direct action upon the sympathetic centre or centres—as direct as occurs in galvanism.

The application of a similar principle, in regard to the functions of the cerebrum and the spinal cord, explains the unbalanced action of the latter when the former is temporarily paralysed by mental shock, and probably goes far to explain, without any further principle, the remarkable influence of the emotions in causing convulsive disorders.

That Imagination and Faith can exert some influence over disease, no one, I suppose, disputes. The great question is, what is the extent of this influence—what are its limitations? The inquiry has two important bearings; one on the practical employment of this power in medicine, and the other on the truth of alleged miraculous cures.

I think the cases recorded in these pages prove beyond a doubt that while nervous affections present the grand field for psychical therapeutics, diseases beyond the neurotic boundary may be amenable to the same healing influence, as, for example, gout. On the other hand, I readily grant that for serious organic affections the range of mental influence is decidedly limited. At the same time, seeing that it is indisputable that in health the frame or attitude of mind acts powerfully upon the skin, kidneys, and bowels, and seeing that the *rôle* of the physician is to act upon these, there is no good reason for excluding the beneficial influence of mental agents in some non-nervous affections. That these may act injuriously, even unto death in organic diseases, daily experience proves; why then may they not act in the direction of health and life? Lastly, who shall venture to draw the line between organic and functional; and who will pretend to assert that any tissue of the body is beyond the range of nervous influence?

The alleged miracles of our day, brought prominently to the front in articles in the 'Nineteenth Century' have attested the fresh interest attaching to the question of their true character. Too generally have the combatants debated the question as if there were but two

rival camps in the field, as if, in short, there were no alternative between knavery and miracle, whereas if the principles insisted upon in this volume be true, the vast mass of these alleged supernatural cures admit of another interpretation—one less repulsive to the charity which hopeth all things, whether in those who eagerly apply to their sores the cement of the chapel at Knock, or who flock, full of faith, to the grotto of Our Lady at Lourdes. If, however, cures are performed which transcend the power of the wildest imagination and the most ardent faith to effect; if fractures are instantly set, if cancers are presently dispelled, then the explanations offered in this work are insufficient, and others must be sought outside the realm of psycho-physical phenomena, one into which the author does not presume to enter.

The extraordinary effects produced by the Imagination and by the force of the Will, recorded in the preceding pages would, in truth, leave upon the reader's mind a too unqualified impression, if he did not at the same time bear in mind that there are limits to their influence. The case of Edward Irving shows the marvellous influence of faith and determination; but the final incident of his life illustrates equally well the remark we have just made.

He had been strongly recommended by his physician to seek health in a milder climate, but it would seem that he regarded himself commissioned to do a great work in Scotland. His letters home clearly enough indicate the certain advance of fatal disease, accompanied by his repeated expressions of belief that he would not die. "He had not yet come" says his biographer, "to the discussion of that last question which, like all the

rest, was to be given against him, but still smiled with a heart-breaking confidence over the daily dying of his own wasted frame, waiting for the wonderful moment when God should send back the vigorous life-current to his forlorn and faithful heart." Dr Rainey attended him in his dying hours and described to Mrs Oliphant "the noble, wasted figure, stretched in utter weakness, but utter faith," expecting that life and strength would still arise out of visible dying. Irving assured him "how well he knew that he was to all human appearance dying, yet how certainly he was convinced that God yet meant to raise him." But Faith and Will have their limits, and poor Irving died in spite of their exercise to an extent unsurpassed, so far as I am aware, in any other instance. Not long before his death "they heard him murmuring to himself in inarticulate argument, confusedly struggling in his weakness to account for this visible death which, at last, his human faculties could no longer refuse to believe in" (Mrs Oliphant's 'Life of Edward Irving,' p. 404).

A striking instance of the failure of an attempt to cure disease through the medium of the Imagination occurred some years ago in Germany. A Curé in the Canton of Reichshoffen announced to his parishioners that in concert with Prince Hohenlohe he would, on a certain day, cure those who were ill of their disorders. For this purpose he appointed a day on which he would say mass, and he promised that those who were present at its celebration should be healed. In the mean time, an interval of nine days, he engaged in devotion on behalf of the sick in his commune. The day came. From ten o'clock the sound

of the bells gave notice that the ceremony was being performed. Crowds of patients flocked to the church. The preacher was eloquent, the whole service imposing—there seems no reason to suppose that Faith and Hope were not duly worked upon, but it was a terrible failure. The poor creatures returned home worse than when they came, harassed and disappointed, “desesperant d’obtenir jamais,” adds the *Courrier du Bas-Rhin*, from which this account is taken “une guérison que le ciel venait de refuser, malgré les promesses si positives du Curé” (lx, p. 54).

It may be supposed that the Curé did not possess that undefinable and inimitable something—tact, pluck, or infectious confidence—which was the gift of Prince Hohenlohe, and without which the ceremony performed with all due form proved insufficient to raise the diseased to the cure-pitch of enthusiasm and faith. Something may have been due to the incurable nature of the cases which the imitator of Hohenlohe attempted to cure; but this would not explain the total failure of the experiment, inasmuch as many popular lay curers of disease, and I believe Hohenlohe himself, have been unable to *choose* their cases, and have had to depend for success on the large proportion of favorable results.

We might refer also here to the cases of ecstatic mysticism, in which dwelling intently and rapturously upon the passion of the Saviour either failed altogether to produce the stigmata so readily induced in others of more susceptible temperament, or produced them after a longer time. As pointed out by M. Maury (op. cit., p. 219), Ursula Aguir, and Hieronyma Carnaglio, although in their ecstatic visions they believed they had received the wounds which

were inflicted upon Christ, and although experiencing all the torture thereof, did not exhibit the slightest trace upon their persons of these wounds. So with Catherine of Vienna, Magdeleine de Pazzi, Coleta, and others mentioned by the same author. St Gertrude (14th century) imagined in one of her visions that she had received a rose-coloured mark on the skin from contact with Christ, but not the slightest trace of the mark was found. Again several saints, however intently dwelling upon "the crown of thorns," and fully experiencing, in vision, all the sufferings of the Saviour, found no impressions or only very slight ones, when others more favoured presented decided results upon the skin.

In connection with the limits of the power of the imagination to cure disease, ought to be considered the liability to relapse. There can be no doubt that in a very considerable number of cases relieved by this means, relapse occurs sooner or later. Madame de St Amour's success in controlling disease through the operation of purely mental agents has been several times referred to in this volume. An apparently reliable witness of many of her apparent cures observes, "Nearly all the cures have been temporary. . . . I have seen a young lady walk straight at the command of Madame de St Amour. I was told her ordinary walk was a limp, but not having myself seen this, I doubted the fact. The improvement did not last; a week after she began to limp as much as ever." He adds, "it is precisely the relapse which has removed my suspicions, and has rendered still more inexplicable to me, the mode of action of Madame de St. Amour's cures" (lx, p. 59).

The psycho-physical forces have then, their limits both in regard to extent, and in regard to the duration of influence, and there remains a third indication of limitation. The Imagination fails altogether to produce certain phenomena in certain persons. The witness of the success of Madame de St Amour after his narrative thus proceeds: "I now come to my own experience. Having experienced for a considerable time some pains in the epigastrium, I begged Madame de St Amour to relieve me. She endeavoured to do so, but in vain. On another occasion, I saw her extend her hands towards those who surrounded her, and ask them whether they experienced a sense of coolness. Each person answered 'yes!' but the fact is that, as regards myself, I felt nothing at all" (l. c.).

Not only is the Will limited in its power to resist disease, but in some cases the more the will is exercised the more troublesome the disorder becomes. This applies to nervous affections in which the struggle between the will and the fear of failure produces increased irregular action. Thus in the example of contraction of the mastoid narrated by Hunter, the expectation of seeing a stranger before whom the lady was particularly anxious not to exhibit the defect, paralysed her will and induced overpoweringly violent spasm.

It may be objected to a large number of the illustrations recorded in this volume that they are not recent cases, and I have heard the question asked why, if they happened some years ago, do they not happen now? My reply is that they do happen now—that they are always happening. Make what allowance you will for the possible deception and the certain errors in diagnosis of dis-

ease in the miraculous cures at Lourdes, make a like deduction from the recoveries occurring at the "Beth-shan" house in the north of London under the Rev. W. E. Broadman; take off a considerable percentage from the cures performed by homœopaths as due no doubt to the *vis medicatrix Naturæ*, unaided by mental influences; and you will still have, I maintain, ample evidence of the therapeutic influences of Expectation, Faith, and the concentration of the Attention on the seat of the disease. That this question should be asked, and that grave doubts should be expressed as to the reliability of the cases on record of the remarkable influence of the mind in the cure of disease, is a striking proof of the necessity which I confess I have sometimes doubted, of recording case after case, with a view of placing beyond the possibility of cavil by reasonable men, the fact that mental excitement directed in a certain channel will exercise the influence claimed for it in this volume.

If I am mistaken, and have grossly exaggerated this power, if the cases recorded are not really examples of mental influence; if rheumatism was not cured by wooden tractors at the Bath Hospital; if scurvy has not been relieved by inert potions; if gout has not been cured by fright; if warts do not disappear under confident expectation or faith, then, indeed, we are thrown back upon preternatural explanations, and the actual efficacy of charms and of infinitesimal doses must be credited. For just in proportion as the range of the influence of the mind upon the body in health and disease is circumscribed and narrowed, will the area of the charlatan be extended and fortified.

It would be certainly quite possible to substitute for all the old cases recorded in this volume, more recent examples, but to the next generation these would on the ground of age be equally open to criticism. Besides, we do not attach so much importance to our own testimony as to suppose that the reader would credit a case witnessed and reported by ourselves, more than one given on the authority of Rush, Hunter, Abercrombie, Sir John Forbes, or the surgeons of the Bath Hospital.

That the principles upon which so much stress is laid in this work admit of practical application, not only to the treatment of diseases but to questions arising in the law courts, was shown in the case of *Gaunt v. Fynney* in the Court of Chancery Nov. 14th, 1873. The plaintiffs were two unmarried ladies living at Leek in Staffordshire who applied for an injunction to restrain an alleged nuisance by noise and vibration occasioned by the working of an engine and machinery in the silk mills of the defendant. There were other matters of complaint to which it is unnecessary to refer. (Upon the hearing of the case before the Master of the Rolls in the preceding February he was of opinion that the plaintiffs were not entitled to an injunction.) In the Court of Chancery, Mr Fry, Q.C. urged for the defendant, among other reasons, that the influence of the imagination would, as stated in this work, materially affect the impressions received by persons constantly dwelling upon a nuisance of this nature, and quoted from these pages in support of his contention. The Lord Chancellor (Selborne) in delivering judgment observed as reported in the 'Times,' "Those who compare the noise which they hear to-day with the noise which

they heard months or years ago are witnesses (within certain limits) to impressions upon the mind, rather than to facts. Those who speak of the manner in which the engine and machinery have been worked and the business of the mill carried on, speak of facts and not of impressions upon the mind. Mr Fry made a happy use, in part of his argument, of a passage in a recent work upon mental science, which, treating of the influence of the mind upon the sense of hearing, says that 'the thought uppermost in the mind, the predominating expectation, makes a real sensation from without assume a different character.' Every one must have had some experience of the truth of this statement; a nervous or anxious or prepossessed listener hears sounds which would otherwise have passed unnoticed, and magnifies and exaggerates with some new significance, originating within himself, sounds which at other times would have been passively heard and not regarded. In the present case I have no doubt that a real 'whirring sound,' such as the plaintiffs' witnesses describe, did proceed from the machinery in the mill when at work at all times, before as well as after the erection of the steam-engine in 1864-5. But this is admitted to have gone on from January 1865, to June, 1870, without amounting to a nuisance. His Lordship then proceeded to comment upon the evidence, observing that there were some facts clearly established by trustworthy evidence which appeared to him to be inconsistent with plaintiffs' case, and that it was proved to his entire satisfaction that on the 17th of July, 1871, when the engine was worked at its full speed, and in its usual manner, no noise or

vibration, amounting to a nuisance, was heard or felt in any part of the plaintiffs' premises." The plaintiffs' appeal petition was dismissed with costs.

In the course of this inquiry, I have, I trust, succeeded in one of the objects I had in view, that of elucidating the nature and action of what is usually understood as the Imagination.

I hope, in conclusion, that some positions open to attack have been made more secure by the evidence collected together in this work.

I think, for example, that the reader who has had the patience to accompany the author *ab ovo usque ad mala* will agree with him, that they are needlessly sceptical who, with a well-known physician, "doubt the instances of sudden change in the colour of the hair consequent on a powerful mental emotion, the evidence by which such instances are supported being questionable," and that those greatly err who believe, with an able writer on this subject, that "the Imagination is all-powerful, *except over disease*—the dominion of disease being exerted over Imagination itself."

Imperfect as the handling of this wide and important subject has been in its varied aspects, the Author trusts that he has succeeded in placing upon a firm and rational basis the complex phenomena resulting from the Influence of the Mind upon the Body.*

* The Author has concluded to reserve for another publication the additional matter referred to at p. 311 of vol. i of this work.

APPENDIX

IN the former edition of this work we gave a detailed analysis of the cases referred to, with a view of determining the relative influence of the various mental states. We do not think it necessary, however, to do more than indicate in general terms the results to which this analysis pointed :

1. Out of the total number of illustrations, about 35 per cent. were derived from intellectual states (Imagination, Expectation, Attention, Imitation and Sympathy, Memory, and Excess of Study) ; 56 per cent. were of emotional origin, while barely 8 per cent. illustrated the influence of Volition.

2. Of Intellectual States, Imagination and Expectation exerted most influence ; of Emotional States, Fear and Fright were the most potent. .

The above is, of course, an exceedingly rough estimate of the proportionate influence of these states. Still, it is relatively correct ; and in the sense in which the expression "influence of the Mind upon the Body" is employed in this work, we reach by statistics very much the result we should expect, namely, that the direct action of the Will, however important, is the least frequently exerted

power in relation to the psycho-physical phenomena which we have been desirous to investigate; that the Intellect, comprising among other faculties that of Attention, directed in the first instance by the Will, exerts a greater influence; while the Emotions far exceed both put together in their action, whether in health or disease, upon the bodily organs and tissues.

One striking fact is elicited by this investigation, that while the emotions are by far the most operative in what we may call chance cures of disease, they have, with the exception of Hope and Faith, which can only be distinguished from simple Expectation by their intensity, comparatively slight influence in regularly designed Psycho-therapeutics, in which the Imagination, Expectation, and Attention play the most important part. I am disposed to think, however, that in Braidism the remarkable change which can be induced in the circulation by combined physical and psychical processes, answers in great measure to that which occurs from powerful emotional excitement. Hence rheumatism may be relieved in both instances, as, for example, in the railway accident referred to in the Preface, or in the operation performed by Mr Braid in such a case as that mentioned under "Psycho-therapeutics." The condition of the circulation is entirely altered, and local congestions are removed.

3. *Sex, age, disease.*—As regards *sex*, out of the cases in which the sex is stated, 64 per cent. were males, and 36 per cent. females. The large proportion of the former shows (what is very important) that men are highly susceptible to mental impressions, and that, there-

fore, Psycho-therapeutics are available for them as well as for women. It is not, as is so often intimated, only hysterical young ladies who come under the influence of this agency. At the same time it would not be fair to conclude from this analysis that men are more or even equally liable to be affected by psychical forces, because the very frequency of examples of such influence among females prevents medical men reporting them, while they do report cases which occur in men on account of their being rarer, and therefore more interesting. We therefore simply maintain that there is ample proof that the bodies of men as well as women may be largely acted upon by the influence in question. In reference to *age*, it has been impossible to obtain it in the majority of cases, but it may be stated generally that, with the exception of about 12 per cent., the individuals were adults, their age probably being, in most instances, between twenty and thirty-five. Lastly, the most frequent forms of *disease* induced in persons in health were those comprised under convulsive affections, epilepsy, chorea, paralysis agitans, and hydrophobia; while the diseases most frequently benefited were undoubtedly rheumatism, gout, and dropsy, the last mentioned being relieved by the increased action of the kidneys from mental influence. No doubt, however, if all the cases of hysterical neuralgia and contraction of joints were reported, those which are called merely nervous affections of the body would take priority. The only inference which we are justified in drawing from these figures is that the beneficial influence of Psycho-therapeutics is by no means confined to nervous disorders. It is also satisfactory to

know that, as respects occupation or position in life, very opposite classes are represented—the rich and the poor, the learned and the ignorant. Even incredulity, when the attention can be arrested, is not necessarily a bar to success. Failure, on the other hand, it must be remembered, may attend all systems of treatment; and what Bacon says in reference to one form of Psychotherapeutics may be applied to all—“Men are to be admonished that they do not withdraw credit from the operations of the Imagination because the effects fail sometimes.”

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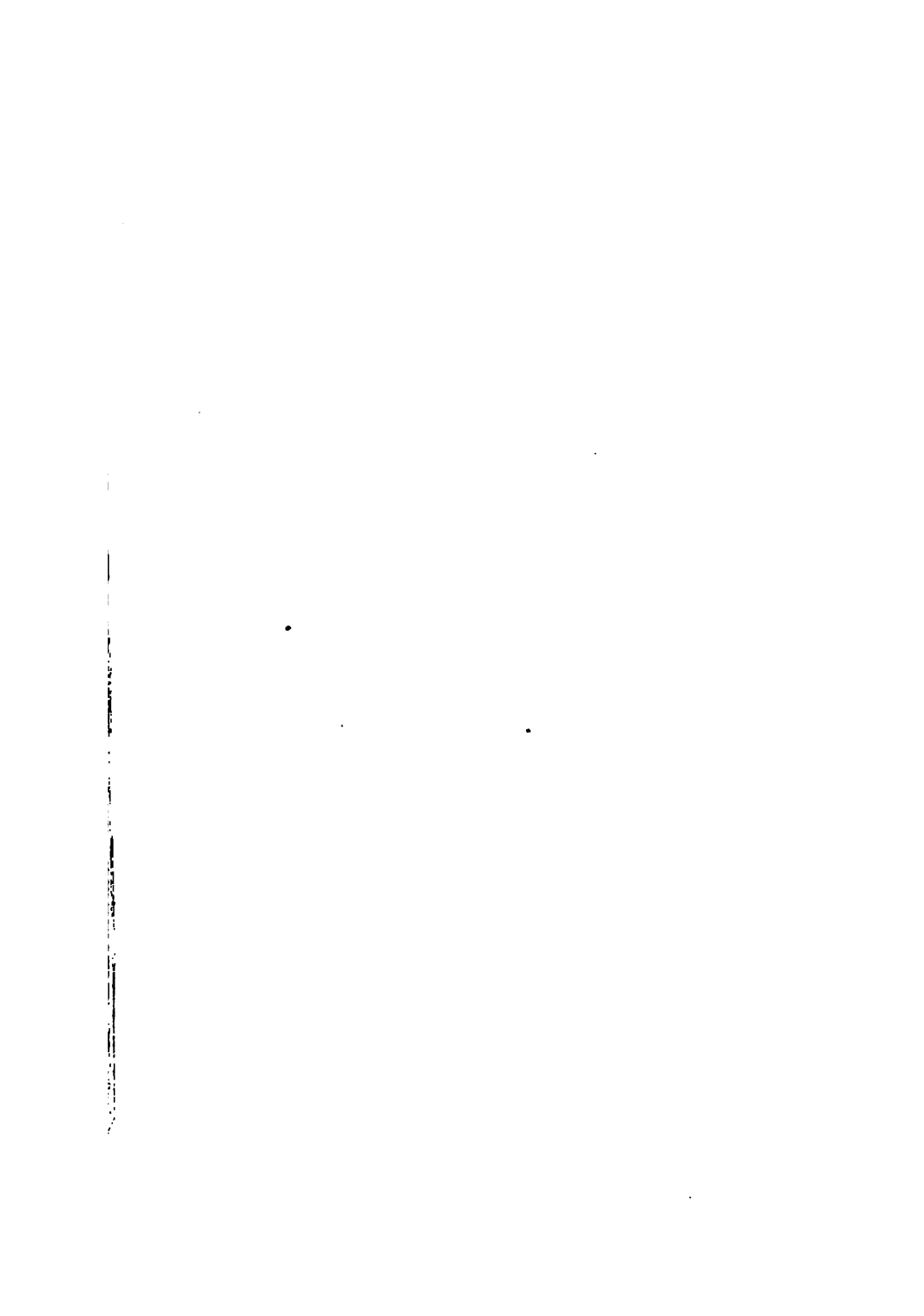
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